NOVATEK
聯 詠 科 技

Data Sheet

For ***NT71870-3***

Timing Controller for High Performance LCD Panel_AUX_Application Note

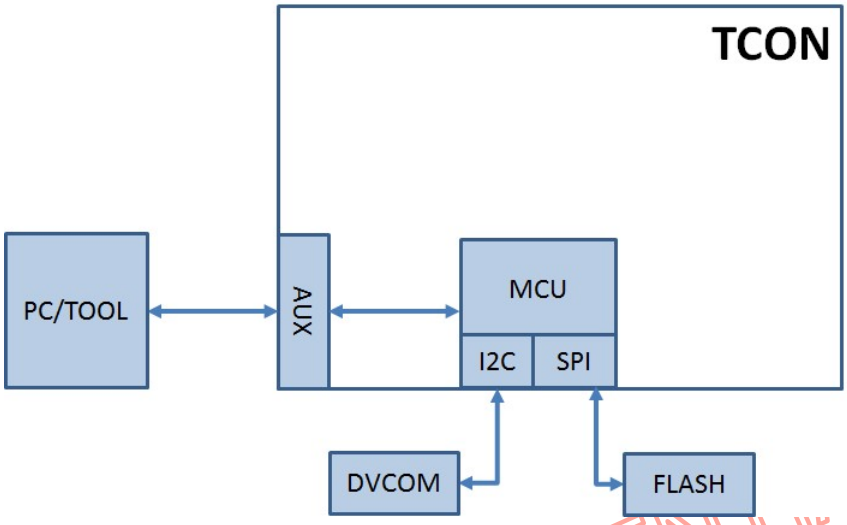
Preliminary V2.3

Contents

Revision History

Specification Revision History			
Version	**Content**	**Editor**	**Release Date**
0.0	1. Preliminary SPEC V0.0	Yuho Kuo	2015/12/29
0.9	AUX cmd only for 3 patterns of 240 areas(24*10)	Richard Wu	2019/03/18
0.10	Add pattern erase & aux cmd with 8-bytes	Richard Wu	2019/4/1
0.11	Add manual HDR function check	PC Chen	2019/5/22
0.12	Add LED driver current (only for TLC5955)	PC Chen	2019/10/21
0.13	Add backlight full white	Nick.yu	2019/11/01
0.15	AUX cmd only for 3 patterns of 240 areas(15*16)	PC Chen	2020/7/8
0.16	AUX cmd for general 3 pattern	Richard Wu	2020/08/27
1.16	Supplement the CMD17	Nick.yu	2020/09/03
2.0	AUX cmd only for NT71873 w/ 3 patterns of 512/240 areas	PC Chen	2021/1/22
2.1	Modify AUX cmd for disable local dimming function(page-43)	PC Chen	2022/7/7
2.2	Add Slow down I2C speed for safe communication	PC Chen	2022/8/4
2.3	Add EDID block3 & Modify EDID CMD	Nick.yu	2023/8/3

1. Block Diagram



2. AUX command descriptions

1.Write Flash protect command

step	AUX command	description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	8 00480 00 5A 8 00480 00 A5 8 00480 00 C3 8 00480 00 3C 8 00480 00 AA	關閉 WP 功能 Wr DPCD 0x00480=5A Wr DPCD 0x00480=A5 Wr DPCD 0x00480=C3 Wr DPCD 0x00480=3C Wr DPCD 0x00480=AA
3	**4 00060 01 FF 01**	**Write Aux Device Address:0x00060, page 0xFF; offset:01;**
	4 00060 00 9C	**Write Aux Device Address:0x00060, Write protect data:9C**
	0 00060	MOT=0,Release I2C Bus
4	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

PS: protect data 依照各 Flash protect command 定義

2.Disable Flash protect command

step	AUX command	description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	8 00480 00 5A 8 00480 00 A5 8 00480 00 C3 8 00480 00 3C 8 00480 00 AA	關閉 WP 功能 Wr DPCD 0x00480=5A Wr DPCD 0x00480=A5 Wr DPCD 0x00480=C3 Wr DPCD 0x00480=3C Wr DPCD 0x00480=AA
3	**4 00060 01 FF 01**	**Write Aux Device Address:0x00060, page 0xFF; offset:01;**
	4 00060 00 00	**Write Aux Device Address:0x00060, Write protect data:00**
	0 00060	MOT=0,Release I2C Bus
4	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

3.Read Flash protect command

step	AUX command	description
1	8 00102 00 C0	Write DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00060 01 FF 02	Write Aux Device Address:0x00060, page 0xFF; offset:02;
	5 00060 00	Restart MOT=1,Read Data
	1 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Write DPCD 0x00102=0x00 開啟 16/32 mode function

PS: Write Protect register 後經過多久可以 Read 時間依照各 Flash 定義，EXP 如下圖，Flash write status register time 最少需等待 15ms 後再讀值

W25Q20BW

winbond

9.7 AC Electrical Characteristics (cont'd)

DESCRIPTION	SYMBOL	ALT	SPEC			UNIT
			MIN	TYP	MAX	
/HOLD Active Hold Time relative to CLK	t_{CHHH}		5			ns
/HOLD Not Active Setup Time relative to CLK	t_{HHCH}		5			ns
/HOLD Not Active Hold Time relative to CLK	t_{CHHL}		5			ns
/HOLD to Output Low-Z	t_{HHQX}(2)	t_{LZ}			7	ns
/HOLD to Output High-Z	t_{HLQZ}(2)	t_{HZ}			12	ns
Write Protect Setup Time Before /CS Low	t_{WHSL}(3)		20			ns
Write Protect Hold Time After /CS High	t_{SHWL}(3)		100			ns
/CS High to Power-down Mode	t_{DP}(2)				3	µs
/CS High to Standby Mode without Electronic Signature Read	t_{RES1}(2)				30	µs
/CS High to Standby Mode with Electronic Signature Read	t_{RES2}(2)				30	µs
/CS High to next Instruction after Suspend	t_{SUS}(2)				20	µs
Write Status Register Time	tw			10	15	ms

4.Write EDID device @ Flash (32 mode I2C command)

(If Flash is protected, need to unprotect first. [AUX cmd 2])
(After change EDID setting, strongly recommend to protect FLASH[AUX cmd 1])

step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00062 01 FF 01	**Write Aux Device Address:0x00062, page 0xFF; offset:01;**
	4 00062 00 00	**Write Aux Device Address:0x00062,** **Write protect data:00**
	0 00062	MOT=0,Release I2C Bus
3	4 00062 01 0A 00	Slow down I2C speed for safe communication
	4 00062 00 7F	
	4 00062 00 FE	
	4 00062 00 FE	
	4 00062 00 FE	
	0 00062	
	Wait 2 frames	
4	4 00062 01 60 00	Write Aux Device Address:0x00062, page 0x60; offset = 00
	4 00062 00 data0	MOT=1, Write Data0
	4 00062 00 data1	MOT=1, Write Data1
	4 00062 00 data2	MOT=1, Write Data2
	……	MOT=1, Write Data….
	4 00062 00 data(n-1)	MOT=1, Write Data(n-1)
	0 00062	MOT=0, Release I2C Bus
5	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

PS: 4 00060 00 data (n-1) & 0 00060 can combined to 0 00060 00 data(n-1)

5.Read EDID device @ Flash (32mode I2C command)

step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	8 00480 00 5A 8 00480 00 A5 8 00480 00 C3 8 00480 00 3C 8 00480 00 AA	關閉 WP 功能 Wr DPCD 0x00480=5A Wr DPCD 0x00480=A5 Wr DPCD 0x00480=C3 Wr DPCD 0x00480=3C Wr DPCD 0x00480=AA
3	4 00062 01 0A 00	Slow down I2C speed for safe communication
	4 00062 00 7F	
	4 00062 00 FE	
	4 00062 00 FE	
	4 00062 00 FE	
	0 00062	
	Wait 2 frames	
4	4 00062 01 60 00	Write Aux Device Address: 0x00062, page=60, offset=00
	5 00062 00	MOT=1, Read Data0
	5 00062 00	MOT=1, Read Data1
	…..	MOT=1, Read Data….
	5 00062 00	MOT=1, Read Data(n-1)
	1 00062	MOT=0, Release I2C Bus
5	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

6.Write DVcom device @ EE_I2C (16 mode I2C command)

Type1)Depend on DVCOM command**(有register offset)**

step	AUX command		description
1	Request Reply	80 0102 00 C0 00	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	Request Reply	80 048B 00 18 00	Wr DPCD 0x0048B=0x18 1. 選擇 AUX 只通過 EE_I2C 2. 開啟 I2C through mode 3. 關閉 EDID from ram 功能
3	Request Reply	40 004F 00 2C 00	Write Aux Device Address:0x0004F, word offset:2C (如果不用 offset 不用打此行) (以實際應用 DVCOM 規範設計為準)
	Request Reply	40 004F 00 AA 00	MOT=1,Write Data0=0xAA (以實際應用 DVCOM 規範設計為準)
	Request Reply	00 00 4F 00	MOT=0,Release I2C Bus
4	Request Reply	80 04 8B 00 00 00	Wr DPCD 0x0048B=0x00
5	Request Reply	80 01 02 00 00 00	開啟 16/32 mode function

Type2)Depend on DVCOM command**(沒有register offset)**

step	AUX command		description
1	Request Reply	80 01 02 00 C0 00	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	Request Reply	80 04 8B 00 18 00	Wr DPCD 0x0048B=0x18 1. 選擇 AUX 只通過 EE_I2C 2. 開啟 I2C through mode 3. 關閉 EDID from ram 功能
3	Request Reply	40 00 60 01 0A 26 00	修改設定為相容沒有 offset 的 I2C over AUX 轉換
	Request Reply	00 00 60 00 C1 00	
4	Request Reply	40 00 4F 00 80 00	Write Aux Device Address:0x0004F Data 0x80
	Request Reply	00 00 4F 00	MOT=0,Release I2C Bus
5	Request Reply	40 00 60 01 0A 26 00	切回設定
	Request Reply	00 00 60 00 81 00	
6	Request Reply	80 04 8B 00 00 00	Wr DPCD 0x0048B=0x00
7	Request Reply	80 01 02 00 00 00	開啟 16/32 mode function

PS: DVcom device address: 0x4F (same as NT71892)=01001111，I2C address =10011110=0x9E

7.Read DVcom device @ EE_I2C (16 mode I2C command)

Type1)Depend on DVCOM command(有register offset)

step	AUX command		description
1	Request Reply	80 01 02 00 C0 00	Wr DPCD 0x00102=0xC0 切換 16/32 mode function
2	Request Reply	80 04 8B 00 18 00	Wr DPCD 0x0048B=0x18 1. 選擇 AUX 只通過 EE_I2C 2. 開啟 I2C through mode 3. 關閉 EDID from ram 功能
3	Request Reply	40 00 4F 00 2C 00	Write Aux Device Address: 0x0004F, word offset = 2C (如果不用 offset 不用打此行) (以實際應用 DVCOM 規範設計為準)
	Request Reply	50 00 4F 00 00 AA	MOT=1,Read Data0 (以實際應用 DVCOM 規範設計為準)
	Request Reply	10 00 4F 00	MOT=0,Release I2C Bus
4	Request Reply	80 04 8B 00 00 00	Wr DPCD 0x0048B=0x00
5	Request Reply	80 01 02 00 00 00	切換 16/32 mode function

Type2)Depend on DVCOM command**(沒有register offset)**

step	AUX command		description
1	Request Reply	80 01 02 00 C0 00	Wr DPCD 0x00102=0xC0 切換 16/32 mode function
2	Request Reply	80 04 8B 00 18 00	Wr DPCD 0x0048B=0x18 4. 選擇 AUX 只通過 EE_I2C 5. 開啟 I2C through mode 6. 關閉 EDID from ram 功能
3	Request Reply	40 00 60 01 0A 26 00	修改設定為相容沒有 offset 的 I2C over AUX 轉換
	Request Reply	00 00 60 00 C1 00	
4	Request Reply	50 00 4F 00 20	Write Aux Device Address: 0x0004F, MOT=1 reply DEFER
	Request Reply	50 00 4F 00 20	由於上一筆回 DEFER，需再下一次 request。 直到回應 data 為止。
	…	…	…
	Request Reply	50 00 4F 00 00 80	MOT=1,Read Data0(以範例來說為 0x80)
	Request Reply	10 00 4F 00	MOT=0,Release I2C Bus
5	Request Reply	40 00 60 01 0A 26 00	切回設定
	Request Reply	00 00 60 00 81 00	
6	Request Reply	80 04 8B 00 00 00	Wr DPCD 0x0048B=0x00
7	Request Reply	80 01 02 00 00 00	切換 16/32 mode function

8.AUX enable / disable PSR (32mode I2C command)

step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00062 01 0A 00	Slow down I2C speed for safe communication
	4 00062 00 7F	
	4 00062 00 FE	
	4 00062 00 FE	
	4 00062 00 FE	
	0 00062	
	Wait 2 frames	
3	4 00062 01 85 07	Write Aux Device Address:0x00062, page 0x85; offset:07
	4 00062 00 B1	Write Aux Device Address:0x00062, data:B1
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 AA	Write Aux Device Address:0x00062, page 0x85; offset:AA
	4 00062 00 48	Write Aux Device Address:0x00062, data:48
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 AE	Write Aux Device Address:0x00062, page 0x85; offset:AE
	4 00062 00 07	Write Aux Device Address:0x00062, data:07
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 67	Write Aux Device Address:0x00062, page 0x85; offset:67
	4 00062 00 41	Write Aux Device Address:0x00062, data:41
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 AF	Write Aux Device Address:0x00062, page 0x85; offset:AF
	4 00062 00 08	Write Aux Device Address:0x00062, data:08
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 83 78	Write Aux Device Address:0x00062, page 0x83; offset:78
	4 00062 00 01	Write Aux Device Address:0x00062, data:01
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 83 7A	Write Aux Device Address:0x00062, page 0x83; offset:7A
	4 00062 00 01	Write Aux Device Address:0x00062, data:01

	0 00062	MOT=0,Release I2C Bus
	4 00062 01 83 7F	Write Aux Device Address:0x00062, page 0x83; offset:7F
	4 00062 00 01	Write Aux Device Address:0x00062, data:01
	0 00062	MOT=0,Release I2C Bus
4	測試 pattern(打其他畫面測試)	此時送 DPCD command 無效
5	4 00062 01 83 7F	Write Aux Device Address:0x00062, page 0x83; offset:7F
	4 00062 00 00	Write Aux Device Address:0x00062, data:00
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 83 7A	Write Aux Device Address:0x00062, page 0x83; offset:7A
	4 00062 00 00	Write Aux Device Address:0x00062, data:00
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 83 78	Write Aux Device Address:0x00062, page 0x83; offset:78
	4 00062 00 01	Write Aux Device Address:0x00062, data:01
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 AF	Write Aux Device Address:0x00062, page 0x85; offset:AF
	4 00062 00 09	Write Aux Device Address:0x00062, data:09
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 67	Write Aux Device Address:0x00062, page 0x85; offset:67;
	4 00062 00 40	Write Aux Device Address:0x00062, data:40
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 AE	Write Aux Device Address:0x00062, page 0x85; offset:AE;
	4 00062 00 05	Write Aux Device Address:0x00062, data:05
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 AA	Write Aux Device Address:0x00062, page 0x85; offset:AA;
	4 00062 00 08	Write Aux Device Address:0x00062, data:08
	0 00062	MOT=0,Release I2C Bus
	4 00062 01 85 07	Write Aux Device Address:0x00062, page 0x85; offset:07

	4 00062 00 31	Write Aux Device Address:0x00062, data:31
	0 00062	MOT=0,Release I2C Bus
6	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

PS: step 2 為開啟 PSR 相關設定，並開啟 PSR mode; step 4 為關閉 PSR，並關閉相關設定。各 command 間請 delay 10ms 時間。

9.Bypass PWMI

step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00060 01 0C 05	Write Aux Device Address:0x00060, page 0x0C; offset:05
	4 00060 00 FF	Write Aux Device Address:0x00060, data:FF
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

10.Disable/Enable CABC function

For CABC disable/enable, the user should read the whole byte value first and then only set bit5 to 0 or 1 and write it back.

Part1: read register value of reg0x20D

step	AUX command	Description
1	8 00102 00 C0	Write DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00060 01 02 0D	Write Aux Device Address:0x00060, page 0x02; offset:0D;
	5 00060 00	Restart MOT=1,Read Data reg0x20D
	1 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Write DPCD 0x00102=0x00 開啟 16/32 mode function

Part2: Set the bit5 of 0x20D to 0(or 1) to disable (or enable CABC)

step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	**4 00060 01 02 0D**	**Write Aux Device Address:0x00060, page 0x02; offset:0D;**
	4 00060 00 setting value	**Write Aux Device Address:0x00060, Write setting value (set the bit5 to 0(or 1) of the value read back at last part)**
	0 00060	MOT=0,Release I2C Bus
4	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

11.Local backlight (only for NT71872 local backlight panel)

step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00060 01 00 08	Write Aux Device Address:0x00060, page 0x00; offset:08
	4 00060 00 DD	Write Aux Device Address:0x00060, data:DD (finction enable key)
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function
4	90 07 20 0f 00 80 0a 00 ff 08 08 08 00 80 00 02 a3 00 ff ff 03	Read DPCD 0x720 16 bytes Get Value of 0x721 = 0x0A (in this case)
5	80 07 21 00 2a 00	Write DPCD 0x00721[5] = 1 (enable backlight control)
6	80 07 40 0f 00 08 18 28 38 48 58 68 78 88 98 a8 b8 c8 d8 e8 00	Write LED0~LED14 Value = 08 18 28 38 48 58 68 78 88 98 a8 b8 d8 e8
7	80 07 40 0f 0f f8 08 18 28 38 48 58 68 78 88 98 a8 b8 c8 d8 00	Write LED15~LED29 Value = f8 08 18 28 38 48 58 68 78 88 98 a8 b8 c8 d8
8	80 07 40 02 9e e8 f8	Write LED30~LED31 Value = e8 f8
9	80 07 21 00 6a 00	Write DPCD 0x00721[6] = 1 (Update backlight control)

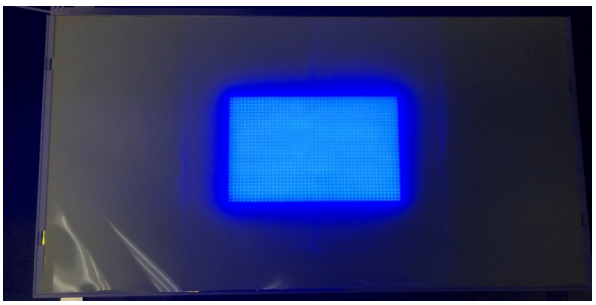
12.Local backlight (only for NT71872 240區-3 pattern) X=24 ; Y=10

Pattern 1: Corner 2.5%面積亮

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 A5	Write Aux Device Address:0x00060, Data:A5
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 00	Write Aux Device Address:0x00060, page 0xF3; offset:00
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 28	Write Aux Device Address:0x00060, page 0xF3; offset:28
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 58	Write Aux Device Address:0x00060, page 0xF3; offset:58
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060,

		Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 80	Write Aux Device Address:0x00060, page 0Xf4; offset:80
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 A8	Write Aux Device Address:0x00060, page 0xF4; offset:A8
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 D8	Write Aux Device Address:0x00060, page 0xF4; offset:D8
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟16/32 mode function

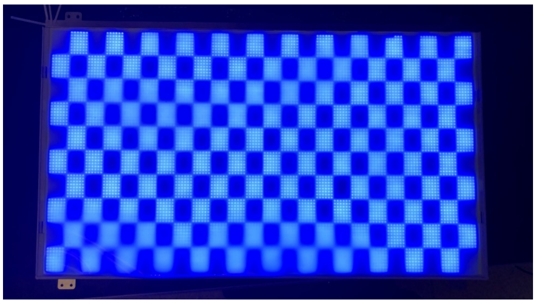
Pattern 2: Center 面積亮



Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 A5	Write Aux Device Address:0x00060, Data:A5
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 A0	Write Aux Device Address:0x00060, page 0xF3; offset:A0
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 D0	Write Aux Device Address:0x00060, page 0xF3; offset:D0
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 00	Write Aux Device Address:0x00060, page 0xF4; offset:00
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 30	Write Aux Device Address:0x00060, page 0xF4; offset:30

	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟16/32 mode function

Pattern3: 240 區間隔棋盤



Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 A5	Write Aux Device Address:0x00060, Data:A5
	0 00060	MOT=0,Release I2C Bus
3	4 00060 01 F3 00	Write Aux Device Address:0x00060, page 0xF3; offset:00
4	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00
	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00
	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00
	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00
	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00

	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00
	Repeat loop step4 4-times	
	0 00060	MOT=0,Release I2C Bus
5	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟16/32 mode function

Pattern Erase

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 A5	Write Aux Device Address:0x00060, Data:A5
	0 00060	MOT=0,Release I2C Bus
3	4 00060 01 F3 00	Write Aux Device Address:0x00060, page 0xF3; offset:00
4	4 00060 07 00 00 00 00 00 00 00 00	Write Aux Device Address:0x00060, Data: 00 00 00 00 00 00 00 00
	Repeat loop step4 59-times	
	0 00060	MOT=0,Release I2C Bus
5	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟16/32 mode function

13.Manual HDR function check

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 00 06	Wr Intel OUI information(1st Byte)
	4 00060 00 57	
	4 00060 00 00	
	0 00060	MOT=0,Release I2C Bus
3	4 00060 00 06	Wr Intel OUI information(2nd Byte)
	4 00060 00 58	
	4 00060 00 AA	
	0 00060	MOT=0,Release I2C Bus
4	4 00060 00 06	Wr Intel OUI information(3rd Byte)
	4 00060 00 59	
	4 00060 00 01	
	0 00060	MOT=0,Release I2C Bus
5	4 00060 00 07	Write Aux Device Address:0x00060, page 0x07;
	4 00060 00 A4	offset:0xA4
	4 00060 00 1B	data:1B (for Intel HDR)
	0 00060	MOT=0,Release I2C Bus
6	測試 pattern(Tunnel)	確認畫面是否有變化
7	4 00060 00 07	Write Aux Device Address:0x00060, page 0x07;
	4 00060 00 A4	offset:0xA4
	4 00060 00 00	data:00
	0 00060	MOT=0,Release I2C Bus
8	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

14.LED driver current (only for NT71872 w/ TLC5955)

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	8 00480 00 5A 8 00480 00 A5 8 00480 00 C3 8 00480 00 3C 8 00480 00 AA	關閉 WP 功能 Wr DPCD 0x00480=5A Wr DPCD 0x00480=A5 Wr DPCD 0x00480=C3 Wr DPCD 0x00480=3C Wr DPCD 0x00480=AA
3	4 00062 00 C8	Write Aux Device Address:0x00062, page 0x38, shift is 0x90
	4 00062 00 01	MOT=1,Write offset 0x01
	4 00062 00 4F	MOT=1,Write data 0x4F(Default)
	0 00062	MOT=0,Release I2C Bus
	Delay 100ms	
	4 00062 00 C8	Write Aux Device Address:0x00062, page 0x38, shift is 0x90
	4 00062 00 02	MOT=1,Write offset 0x02
	4 00062 00 03	MOT=1,Write data 0x03{Default}
	0 00062	MOT=0,Release I2C Bus
	Delay 100ms	
	4 00060 00 02	Write Aux Device Address:0x00060, page 0x02,
	4 00060 00 61	MOT=1,Write offset 0x61
	4 00060 00 69	MOT=1,Write data 0x69
	0 00060	MOT=0,Release I2C Bus
4	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

15.Backlight full white

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 00	Write Aux Device Address:0x00060, Data:00
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟16/32 mode function

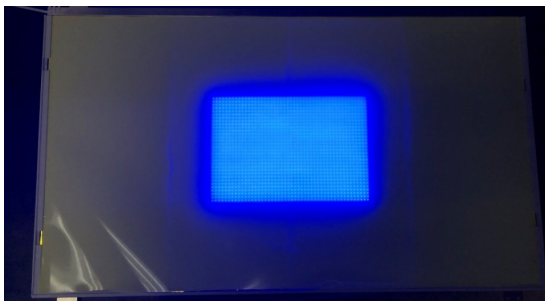
16.Local backlight (only for NT71872 240區-3 pattern) X=15 ; Y=16

Pattern 1: Corner 2.5%面積亮

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 A5	Write Aux Device Address:0x00060, Data:A5
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 00	Write Aux Device Address:0x00060, page 0xF3; offset:00
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 1A	Write Aux Device Address:0x00060, page 0xF3; offset:1A
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 1E	Write Aux Device Address:0x00060, page 0xF3; offset:1E
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 38	Write Aux Device Address:0x00060, page 0xF3; offset:38
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 3C	Write Aux Device Address:0x00060, page 0xF3; offset:3C

	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 56	Write Aux Device Address:0x00060, page 0xF3; offset:56
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 86	Write Aux Device Address:0x00060, page 0xF4; offset:86
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 A0	Write Aux Device Address:0x00060, page 0xF4; offset:A0
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 A4	Write Aux Device Address:0x00060, page 0xF4; offset:A4
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 BE	Write Aux Device Address:0x00060, page 0xF4; offset:BE
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 C2	Write Aux Device Address:0x00060, page 0xF4; offset:C2
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 DC	Write Aux Device Address:0x00060, page 0xF4; offset:DC
	4 00060 03 FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

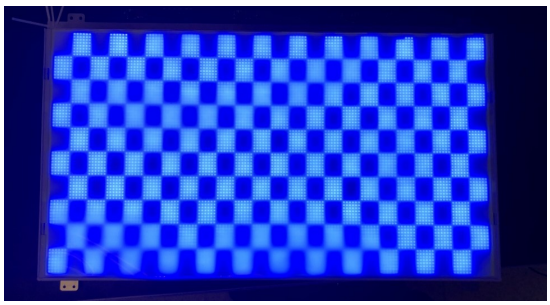
Pattern 2: Center 面積亮



Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 A5	Write Aux Device Address:0x00060, Data:A5
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 A0	Write Aux Device Address:0x00060, page 0xF3; offset:A0
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 01 FF 0F	Write Aux Device Address:0x00060, Data: FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 BE	Write Aux Device Address:0x00060, page 0xF3; offset:BE
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 01 FF 0F	Write Aux Device Address:0x00060, Data: FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 DC	Write Aux Device Address:0x00060, page 0xF3; offset:DC
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 01 FF 0F	Write Aux Device Address:0x00060, Data: FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F3 FA	Write Aux Device Address:0x00060, page 0xF3; offset:FA

	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 01 FF 0F	Write Aux Device Address:0x00060, Data: FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 18	Write Aux Device Address:0x00060, page 0xF4; offset:18
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 01 FF 0F	Write Aux Device Address:0x00060, Data: FF 0F
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F4 36	Write Aux Device Address:0x00060, page 0xF4; offset:36
	4 00060 07 FF 0F FF 0F FF 0F FF 0F	Write Aux Device Address:0x00060, Data: FF 0F FF 0F FF 0F FF 0F
	4 00060 01 FF 0F	Write Aux Device Address:0x00060, Data: FF 0F
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟16/32 mode function

Pattern3: 240 區間隔棋盤



Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 A5	Write Aux Device Address:0x00060, Data:A5
	0 00060	MOT=0,Release I2C Bus
3	4 00060 01 F3 00	Write Aux Device Address:0x00060, page 0xF3; offset:00
4	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 07 00 00 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00 FF 0F
	4 00060 05 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: 00 00 FF 0F 00 00
	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00
	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00
	4 00060 07 FF 0F 00 00 FF 0F 00 00	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F 00 00
	4 00060 05 FF 0F 00 00 FF 0F	Write Aux Device Address:0x00060, Data: FF 0F 00 00 FF 0F
	Repeat loop step4 7-times	
	0 00060	MOT=0,Release I2C Bus
5	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Pattern Erase

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 A5	Write Aux Device Address:0x00060, Data:A5
	0 00060	MOT=0,Release I2C Bus
3	4 00060 01 F3 00	Write Aux Device Address:0x00060, page 0xF3; offset:00
4	4 00060 07 00 00 00 00 00 00 00 00	Write Aux Device Address:0x00060, Data: 00 00 00 00 00 00 00 00
	Repeat loop step4 59-times	
	0 00060	MOT=0,Release I2C Bus
5	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟16/32 mode function

17.Local backlight (only for NT71872 general test pattern command)

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 F1	Write Aux Device Address:0x00060, page 0x00; offset:F1
	4 00060 00 pattern_select	Write Aux Device Address:0x00060, Data: pattern_select
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 00 F0	Write Aux Device Address:0x00060, page 0x00; offset:F0
	4 00060 00 55	Write Aux Device Address:0x00060, Data:55
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟16/32 mode function

Pattern_select :

Pattern 1: 01 (Corner 2.5%面積亮)
Pattern 2: 02 (Center 面積亮)
Pattern 3: 03 (間隔棋盤)

18.Local backlight (only for NT71873 512區-3 pattern) X=32 ; Y=16

Pattern 1: Corner 2.5%面積亮

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F1 21	Write Aux Device Address:0x00060, page 0xF1; offset:21h
	4 00060 00 0F	Write Aux Device Address:0x00060, Data:0Fh
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F5 C9	Write Aux Device Address:0x00060, page 0xF5; offset:C9h
	4 00060 00 07	Write Aux Device Address:0x00060, Data: 07h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F7 00	Update data for test pattern 1
	4 00060 07 3F 00 00 FC 3F 00 00 FC	
	0 00060	
	4 00060 01 F7 08	
	4 00060 07 3F 00 00 FC 00 00 00 00	
	0 00060	
	4 00060 01 F7 10	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 18	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 20	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 28	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 30	
	4 00060 07 00 00 00 00 3F 00 00 FC	
	0 00060	
	4 00060 01 F7 38	
	4 00060 07 3F 00 00 FC 3F 00 00 FC	
	0 00060	
	4 00060 01 00 D0	Write Aux Device Address:0x00060, page 0x00; offset:D0h
	4 00060 00 04	Write Aux Device Address:0x00060, Data: 04h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Pattern 2: Center 面積亮

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F1 21	Write Aux Device Address:0x00060, page 0xF1; offset:21h
	4 00060 00 0F	Write Aux Device Address:0x00060, Data:0Fh
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F5 C9	Write Aux Device Address:0x00060, page 0xF5; offset:C9h
	4 00060 00 07	Write Aux Device Address:0x00060, Data: 07h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F7 00	Update data for test pattern 2
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 08	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 10	
	4 00060 07 00 00 00 00 00 3F FC 00	
	0 00060	
	4 00060 01 F7 18	
	4 00060 07 00 3F FC 00 00 3F FC 00	
	0 00060	
	4 00060 01 F7 20	
	4 00060 07 00 3F FC 00 00 3F FC 00	
	0 00060	
	4 00060 01 F7 28	
	4 00060 07 00 3F FC 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 30	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 38	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 00 D0	Write Aux Device Address:0x00060, page 0x00; offset:D0h
	4 00060 00 04	Write Aux Device Address:0x00060, Data: 04h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Pattern3: 512 區間隔棋盤

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F1 21	Write Aux Device Address:0x00060, page 0xF1; offset:21h
	4 00060 00 0F	Write Aux Device Address:0x00060, Data:0Fh
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F5 C9	Write Aux Device Address:0x00060, page 0xF5; offset:C9h
	4 00060 00 07	Write Aux Device Address:0x00060, Data: 07h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F7 00	Update data for test pattern 3
	4 00060 07 AA AA AA AA 55 55 55 55	
	0 00060	
	4 00060 01 F7 08	
	4 00060 07 AA AA AA AA 55 55 55 55	
	0 00060	
	4 00060 01 F7 10	
	4 00060 07 AA AA AA AA 55 55 55 55	
	0 00060	
	4 00060 01 F7 18	
	4 00060 07 AA AA AA AA 55 55 55 55	
	0 00060	
	4 00060 01 F7 20	
	4 00060 07 AA AA AA AA 55 55 55 55	
	0 00060	
	4 00060 01 F7 28	
	4 00060 07 AA AA AA AA 55 55 55 55	
	0 00060	
	4 00060 01 F7 30	
	4 00060 07 AA AA AA AA 55 55 55 55	
	0 00060	
	4 00060 01 F7 38	
	4 00060 07 AA AA AA AA 55 55 55 55	
	0 00060	
	4 00060 01 00 D0	Write Aux Device Address:0x00060, page 0x00; offset:D0h
	4 00060 00 04	Write Aux Device Address:0x00060, Data: 04h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Pattern Erase

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F1 21	Write Aux Device Address:0x00060, page 0xF1; offset:21h
	4 00060 00 0F	Write Aux Device Address:0x00060, Data:0Fh
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F5 C9	Write Aux Device Address:0x00060, page 0xF5; offset:C9h
	4 00060 00 07	Write Aux Device Address:0x00060, Data: 07h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F7 00	ALL pattern clear
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 08	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 10	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 18	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 20	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 28	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 30	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 38	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 00 D0	Write Aux Device Address:0x00060, page 0x00; offset:D0h
	4 00060 00 04	Write Aux Device Address:0x00060, Data: 04h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

19. AUX cmd for LED Driver setting (Current)

Write setting to LED Driver
(Data : LED 電流設定)

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 D5	Write Aux Device Address:0x00060, page 0x00; offset:D5h
	4 00060 00 01	Write Aux Device Address:0x00060, Data:01h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 00 D6	Write Aux Device Address:0x00060, page 0x00; offset:D6h
	4 00060 00 data	Write Aux Device Address:0x00060, Data: driver setting
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Read setting from LED Driver

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 D6	Write Aux Device Address:0x00060, page 0x00; offset:D6
	5 00060 00	Restart MOT=1,Read Data reg0x00D6
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

CFG5[15:8]	Cuurent(mA)	CFG5[15:8]	Cuurent(mA)	CFG5[15:8]	Cuurent(mA)	CFG5[15:8]	Cuurent(mA)	CFG5[15:8]	Cuurent(mA)	CFG5[15:8]	Cuurent(mA)	CFG5[15:8]	Cuurent(mA)	CFG5[15:8]	Cuurent(mA)	CFG5[15:8]	Cuurent(mA)
0	5.00	31	8.04	62	11.08	93	14.12	124	17.16	155	20.20	186	23.24	217	26.27	248	29.31
1	5.10	32	8.14	63	11.18	94	14.22	125	17.25	156	20.29	187	23.33	218	26.37	249	29.41
2	5.20	33	8.24	64	11.27	95	14.31	126	17.35	157	20.39	188	23.43	219	26.47	250	29.51
3	5.29	34	8.33	65	11.37	96	14.41	127	17.45	158	20.49	189	23.53	220	26.57	251	29.61
4	5.39	35	8.43	66	11.47	97	14.51	128	17.55	159	20.59	190	23.63	221	26.67	252	29.71
5	5.49	36	8.53	67	11.57	98	14.61	129	17.65	160	20.69	191	23.73	222	26.76	253	29.80
6	5.59	37	8.63	68	11.67	99	14.71	130	17.75	161	20.78	192	23.82	223	26.86	254	29.90
7	5.69	38	8.73	69	11.76	100	14.80	131	17.84	162	20.88	193	23.92	224	26.96	255	30.00
8	5.78	39	8.82	70	11.86	101	14.90	132	17.94	163	20.98	194	24.02	225	27.06		
9	5.88	40	8.92	71	11.96	102	15.00	133	18.04	164	21.08	195	24.12	226	27.16		
10	5.98	41	9.02	72	12.06	103	15.10	134	18.14	165	21.18	196	24.22	227	27.25		
11	6.08	42	9.12	73	12.16	104	15.20	135	18.24	166	21.27	197	24.31	228	27.35		
12	6.18	43	9.22	74	12.25	105	15.29	136	18.33	167	21.37	198	24.41	229	27.45		
13	6.27	44	9.31	75	12.35	106	15.39	137	18.43	168	21.47	199	24.51	230	27.55		
14	6.37	45	9.41	76	12.45	107	15.49	138	18.53	169	21.57	200	24.61	231	27.65		
15	6.47	46	9.51	77	12.55	108	15.59	139	18.63	170	21.67	201	24.71	232	27.75		
16	6.57	47	9.61	78	12.65	109	15.69	140	18.73	171	21.76	202	24.80	233	27.84		
17	6.67	48	9.71	79	12.75	110	15.78	141	18.82	172	21.86	203	24.90	234	27.94		
18	6.76	49	9.80	80	12.84	111	15.88	142	18.92	173	21.96	204	25.00	235	28.04		
19	6.86	50	9.90	81	12.94	112	15.98	143	19.02	174	22.06	205	25.10	236	28.14		
20	6.96	51	10.00	82	13.04	113	16.08	144	19.12	175	22.16	206	25.20	237	28.24		
21	7.06	52	10.10	83	13.14	114	16.18	145	19.22	176	22.25	207	25.29	238	28.33		
22	7.16	53	10.20	84	13.24	115	16.27	146	19.31	177	22.35	208	25.39	239	28.43		
23	7.25	54	10.29	85	13.33	116	16.37	147	19.41	178	22.45	209	25.49	240	28.53		
24	7.35	55	10.39	86	13.43	117	16.47	148	19.51	179	22.55	210	25.59	241	28.63		
25	7.45	56	10.49	87	13.53	118	16.57	149	19.61	180	22.65	211	25.69	242	28.73		
26	7.55	57	10.59	88	13.63	119	16.67	150	19.71	181	22.75	212	25.78	243	28.82		
27	7.65	58	10.69	89	13.73	120	16.76	151	19.80	182	22.84	213	25.88	244	28.92		
28	7.75	59	10.78	90	13.82	121	16.86	152	19.90	183	22.94	214	25.98	245	29.02		
29	7.84	60	10.88	91	13.92	122	16.96	153	20.00	184	23.04	215	26.08	246	29.12		
30	7.94	61	10.98	92	14.02	123	17.06	154	20.10	185	23.14	216	26.18	247	29.22		

Note. MBI6334 CFG5(Current) default vaule = 0x76(16.57mA)

Disable Breathe function command

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 00 1D	Write Aux Device Address:0x00060, page 0x00; offset:1Dh
	4 00060 00 01	Write Aux Device Address:0x00060, Data:01h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Update LED Driver current setting to flash

Reference below command flow

Disable Flash protect command -> Update flash setting command -> Write Flash protect command

Disable Flash protect command

step	AUX command	description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	8 00480 00 5A 8 00480 00 A5 8 00480 00 C3 8 00480 00 3C 8 00480 00 AA	關閉 WP 功能 Wr DPCD 0x00480=5A Wr DPCD 0x00480=A5 Wr DPCD 0x00480=C3 Wr DPCD 0x00480=3C Wr DPCD 0x00480=AA
3	**4 00060 01 FF 01**	**Write Aux Device Address:0x00060, page 0xFF; offset:01;**
	4 00060 00 00	**Write Aux Device Address:0x00060, Write protect data:00**
	0 00060	MOT=0,Release I2C Bus
4	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Update flash setting command for 0xD6

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00062 00 90	Write Aux Device Address:0x00062, page 0x00, shift is 0x90
	4 00062 00 D6	MOT=1,Write offset 0xD6
	4 00062 00 data	MOT=1, Data: LED Driver setting
	0 00062	MOT=0,Release I2C Bus
	Delay 100ms	
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Update flash setting command for 0xD5

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00062 00 90	Write Aux Device Address:0x00062, page 0x00, shift is 0x90
	4 00062 00 D5	MOT=1,Write offset 0xD5
	4 00062 00 data	MOT=1, Data:01h
	0 00062	MOT=0,Release I2C Bus
	Delay 100ms	
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Write Flash protect command

step	AUX command	description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	8 00480 00 5A 8 00480 00 A5 8 00480 00 C3 8 00480 00 3C 8 00480 00 AA	關閉 WP 功能 Wr DPCD 0x00480=5A Wr DPCD 0x00480=A5 Wr DPCD 0x00480=C3 Wr DPCD 0x00480=3C Wr DPCD 0x00480=AA
3	**4 00060 01 FF 01**	**Write Aux Device Address:0x00060, page 0xFF; offset:01;**
	4 00060 00 9C	**Write Aux Device Address:0x00060, Write protect data:9C**
	0 00060	MOT=0,Release I2C Bus
4	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Note. protect data follows flash protect command definition

Disable local dimming function command

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F0 21	Write Aux Device Address:0x00060, page 0xF0; offset:21h
	4 00060 00 60	Write Aux Device Address:0x00060, Data:60h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

20.Local backlight (only for NT71873 240區-3 pattern) X=15 ; Y=16

Pattern 1: Corner 2.5%面積亮

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F1 21	Write Aux Device Address:0x00060, page 0xF1; offset:21h
	4 00060 00 0F	Write Aux Device Address:0x00060, Data:0Fh
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F5 C9	Write Aux Device Address:0x00060, page 0xF5; offset:C9h
	4 00060 00 07	Write Aux Device Address:0x00060, Data: 07h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F7 00	Update data for test pattern 1
	4 00060 07 03 E0 01 30 00 00 00 00	
	0 00060	
	4 00060 01 F7 08	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 10	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 18	
	4 00060 05 00 00 0C 80 07 C0	
	0 00060	
	4 00060 01 00 D0	Write Aux Device Address:0x00060, page 0x00; offset:D0h
	4 00060 00 04	Write Aux Device Address:0x00060, Data: 04h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Pattern 2: Center 面積亮

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F1 21	Write Aux Device Address:0x00060, page 0xF1; offset:21h
	4 00060 00 0F	Write Aux Device Address:0x00060, Data:0Fh
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F5 C9	Write Aux Device Address:0x00060, page 0xF5; offset:C9h
	4 00060 00 07	Write Aux Device Address:0x00060, Data: 07h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F7 00	Update data for test pattern 2
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 08	
	4 00060 07 00 00 1F 80 0F C0 07 E0	
	0 00060	
	4 00060 01 F7 10	
	4 00060 07 03 F0 01 F8 00 7C 00 00	
	0 00060	
	4 00060 01 F7 18	
	4 00060 05 00 00 00 00 00 00	
	0 00060	
	4 00060 01 00 D0	Write Aux Device Address:0x00060, page 0x00; offset:D0h
	4 00060 00 04	Write Aux Device Address:0x00060, Data: 04h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Pattern3: 240 區間隔棋盤

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F1 21	Write Aux Device Address:0x00060, page 0xF1; offset:21h
	4 00060 00 0F	Write Aux Device Address:0x00060, Data:0Fh
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F5 C9	Write Aux Device Address:0x00060, page 0xF5; offset:C9h
	4 00060 00 07	Write Aux Device Address:0x00060, Data: 07h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F7 00	Update data for test pattern 3
	4 00060 07 55 55 55 55 55 55 55 55	
	0 00060	
	4 00060 01 F7 08	
	4 00060 07 55 55 55 55 55 55 55 55	
	0 00060	
	4 00060 01 F7 10	
	4 00060 07 55 55 55 55 55 55 55 55	
	0 00060	
	4 00060 01 F7 18	
	4 00060 05 55 55 55 55 55 55 55	
	0 00060	
	4 00060 01 00 D0	Write Aux Device Address:0x00060, page 0x00; offset:D0h
	4 00060 00 04	Write Aux Device Address:0x00060, Data: 04h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

Pattern Erase

Step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉16/32 mode function
2	4 00060 01 F1 21	Write Aux Device Address:0x00060, page 0xF1; offset:21h
	4 00060 00 0F	Write Aux Device Address:0x00060, Data:0Fh
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F5 C9	Write Aux Device Address:0x00060, page 0xF5; offset:C9h
	4 00060 00 07	Write Aux Device Address:0x00060, Data: 07h
	0 00060	MOT=0,Release I2C Bus
	4 00060 01 F7 00	ALL pattern clear
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 08	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 10	
	4 00060 07 00 00 00 00 00 00 00 00	
	0 00060	
	4 00060 01 F7 18	
	4 00060 05 00 00 00 00 00 00	
	0 00060	
	4 00060 01 00 D0	Write Aux Device Address:0x00060, page 0x00; offset:D0h
	4 00060 00 04	Write Aux Device Address:0x00060, Data: 04h
	0 00060	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

21. Write EDID block3 device @ Flash (32 mode I2C command)

(If Flash is protected, need to unprotect first. [AUX cmd 4])
(After change EDID setting, strongly recommend to protect FLASH[AUX cmd 3])

step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	**4 00062 01 FF 01**	**Write Aux Device Address:0x00062, page 0xFF; offset:01;**
	4 00062 00 00	**Write Aux Device Address:0x00062, Write protect data:00**
	0 00062	MOT=0,Release I2C Bus
3	4 00062 01 61 00	Write Aux Device Address:0x00062, page 0x61; offset:00
	4 00062 00 data0	MOT=1,Write Data0
	4 00062 00 data1	MOT=1,Write Data1
	4 00062 00 data2	MOT=1,Write Data2
	.....	
	4 00062 00 data(n-1)	MOT=1, data(n-1)
	0 00062	MOT=0,Release I2C Bus
4	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function

PS: 4 00062 00 data (n-1) & 0 00060 can combined to 0 00062 00 data(n-1)
PS2: It is needed to wait MCU writing data to flash. The waiting time could be calculated by following formula. sector_erase_time and page_program_time need to refer to flash specification as following image shows. Flash specification at here is for reference and user should refer to real flash specification for real data.

MCU_runtime(60ms)+3* sector_erase_time+32*page_program_time

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11.7 AC Electrical Characteristics (cont'd)

DESCRIPTION	SYMBOL	ALT	SPEC			UNIT
			MIN	TYP	MAX	
Page Program Time	tPP			1.5	3	ms
Sector Erase Time (4KB)	tSE			120	250	ms

22. Read EDID block3 device @ Flash (32 mode I2C command)

step	AUX command	Description
1	8 00102 00 C0	Wr DPCD 0x00102=0xC0 關閉 16/32 mode function
2	4 00062 01 61 00	Write Aux Device Address: 0x00062, page=61, offset=00
	5 00062 00	MOT=1,Read Data0
	5 00062 00	MOT=1,Read Data1
	…..	MOT=1,Read Data….
	5 00062 00	MOT=1,Read Data(n-1)
	1 00062	MOT=0,Release I2C Bus
3	8 00102 00 00	Wr DPCD 0x00102=0x00 開啟 16/32 mode function