

# BF7264B/B+/Pro MIPI D-PHY 方案說明



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# 概況:

支援型號:

BF6264B	BF7264B	BF7264B+	BF7264 Pro
	•	•	•

BF7264B/B+/Pro 產品正面有兩個 USB 孔

除主機可繼續使用原 BF6264B 功能外,增加 MIPI D-PHY 分析儀功能。

MIPI D-PHY 方案,規格內容如下:

\_\_\_\_\_

## 1. BF7264B/B+/Pro,32Gb RAM,搭配 MIPI D-PHY 探棒組



## 2. 支援 D-PHY V1.2

Up to 2.0Gbps per lane , 1 + 4 Lanes





可顯示 CSI-2 1.3 或 DSI 1.3 協定封包資料以表格方式呈現,包含 DSI 中的 DCS
 1.3 指令解析

	Timestamp (h:m:s.ms.us.ns dur) Mode	VC	Data Type	DCS (h)	WC	Data (h)	Transaction Type	ECC (h)	CRC (h)
10	10.637.049.8 LP (LP	DT) 0	Generic Long Wri		2	B0 03	Host proces	00 (OK)	F84D (OK)
11	10.637.060.1 LP (LP	DT) 0	DCS Short WRITE,	53 (write control display)		24	Host proces	08 (OK)	
12	10.637.066.5 LP (LP	DT) 0	DCS Short WRITE,	35 (set_tear_on)		00	Host proces	2F (OK)	
13	10.637.083.3 LP (LP	DT) 0	Generic Long Wri		2	B0 04	Host proces	00 (OK)	8CF2 (OK)
14	10.637.105.0 LP (LP	DT) 0	Generic Long Wri		3	EB 00 83	Host proces	1A (OK)	AFA7 (OK)
15	10.637.124.2 LP (LP	DT) 0	Generic Long Wri		2	FB 00	Host proces	00 (OK)	6818 (OK)
16	10.637.179.2 LP (LP	DT) 0	Generic Long Wri		20	C8 01 00 04 FB FC CD 00	Host proces	19 (OK)	B76A (OK)
17	10.637.196.0 LP (LP	DT) 0	Generic Long Wri		2	D6 01	Host proces	00 (OK)	EADA (OK)
18	10.637.208.8 LP (LP	DT) 0	Generic Long Wri		2	B0 03	Host proces	00 (OK)	F84D (OK)
19	10.637.219.1 LP (LP	DT) 0	DCS Short WRITE,	<pre>11 (exit_sleep_mode)</pre>		00	Host proces	36 (OK)	
20	10.837.205.4 LP (LP	DT) 0	DCS Short WRITE,	29 (set display on)		00	Host proces	1C (OK)	
21	10.870.540.9 LP (LP	DT) 0	DCS Short WRITE,	51 (set_display_brightness)		FE	Host proces	0D (OK)	
22	10.870.560.9 LP (LP	DT) 0	DCS READ, no par	DA		00	Host proces	1F (OK)	
23	10.870.562.6 BTA								
24	10.870.571.3 LP (LP	DT) 0	DCS Short READ R			E1 00	Peripheral	27 (OK)	
25	10.870.573.4 BTA								
26	10.897.116.1 HS	0	DCS Long Write/w	<pre>2C (write_memory_start)</pre>	2881	DC AC AA 9A 5A DC DE D2	Host proces	04 (OK)	
27	10.897.116.1 HS	0	End of Transmiss			OF OF	Host proces	01 (OK)	
28	10.897.134.6 HS	0	DCS Long Write/w	3C (write_memory_continue)	2881	CA 1B CC EC 7A 5C 55 D2	Host proces	04 (OK)	
29	10.897.134.6 HS	0	End of Transmiss			OF OF	Host proces	01 (OK)	
30	10.897.153.2 HS	0	DCS Long Write/w	<pre>3C (write_memory_continue)</pre>	2881	CA FD C2 CF F1 B0 3B 77	Host proces	04 (OK)	
31	10.897.153.2 HS	0	End of Transmiss			OF OF	Host proces	01 (OK)	
32	10.897.171.7 HS	0	DCS Long Write/w	<pre>3C (write_memory_continue)</pre>	2881	3A 62 52 93 5E 8A 1B 77	Host proces	04 (OK)	
33	10.897.171.7 HS	0	End of Transmiss			OF OF	Host proces	01 (OK)	
34	10.897.190.2 HS	0	DCS Long Write/w	3C (write_memory_continue)	2881	BA 15 C3 CF E5 B8 1E 6D	Host proces	04 (OK)	
0.5	10 007 100 2 100	0	mad a 6 margaret and			08.08	March more and	01 (077)	

4. 使用 32Gb RAM 搭配硬碟串流來儲存 D-PHY 通訊資料,可完整節錄待測物從 Low Power Mode 初始化到 High Speed Mode 的流程

解析度	可擷取影像量	備註								
1K (FHD 1080x1920)	約 500 frames									
2K (WQHD	約 280 frames									
1440x2560)	»y 200 names									
4K (UHD 2160x3840)	約 120 frames	需要 8 Lane 或是 4 Lane 帶有 DSC 壓 縮								
8K (4320x8192)	不支援	不支援								

可擷取資料量 (以未啟用硬碟串流來估算)

- 5. 提供 Data Filter 功能,可將不必要的影像資料濾除以節省記憶體
- 6. 提供 Search 資料功能
- 7. 提供 ECC/CRC Packet 計算及錯誤顯示
- 可顯示 DSI、CSI 影像資料,包含 RGB、YCbCr、RAW 格式,以及壓縮的 DSC 類型之封包,並統計 Porch 數據。詳細資訊請參考附錄二。



Dicolay Sot	lings	He i
Туре	24bit RGB 8-8-8	
Width Height R-G-B Ord	1080 v 2340 v er R-G-B v	12:49 1月1日 星期四 <sup>二道44</sup> 年9日7
	Pause Stop	Arter      MAXESSMH      HARCHESSMH      TouChrib      MAXESSMH      KARHESSMH      KARHESS



 D-PHY 命令統計功能,包含封包總數、各別指令數量、以長度分類的指令統計以及 錯誤數量統計



Discription	Txns	Bytes	Statistics	Txns	Bytes	
Sampled Bus Error	2455		5E (set_CABC	. 1	1	
DSI Error Report	0		55 (write_pow	2	4	
▼ DSI Bus			53 (write_cont	. 1	1	
VC 0	1044640	29739051	35 (set_tear_on)	) 1	1	
VC 1	18	37	11 (exit_sleep	. 1	1	
VC 2	245	493	29 (set_displa	1	1	
VC 3	499	628	51 (set_displa	1	1	
BTA	14		DA	1	1	
Data Type	1044899	29740212	2C (write_me	407	22385	
DCS Command	521835	28694276	3C (write_me	521293	28670727	
Packet Count	1044900		20 (exit_invert	3	129	
			78	2	86	
			1E	2	86	
			60	2	44	

## 10.D-PHY 命令觸發功能

a. 觸發參數包含命令與參數資料可輸入 32 bytes 的資料做為觸發條件。

可涵蓋所有 Short Packet,以及大部分非影像資料的 Long Packet

Short Packet 長度 4bytes Header

Long Packet 長度 4bytes Header + 28byte Data

- b. 可觸發 CRC/ECC Error
- c. 可透過 Trigger-Out 接孔同步觸發外部的示波器

## 11.TE 通道偵測 (Tearing Effect)

<ul> <li>Tearing Effect Signal</li> </ul>	
LA	1.8V (From Channel A0)  *Additional LA-Probe is required

可偵測螢幕所發送 TE 訊號, 須加購 LA Probe 方能使用此功能。 詳細說明請參考附錄一。



## FAQ

## 1. 支援 MIPI DSI 第幾版的規格,是否有 Differential 對數或 port 數限制呢?

A: 支援到 D-PHY V1.2, 最高 2.0Gbps per lane, 1+4 Lanes。

2. 是否有支援 C-PHY 解碼呢?

A:不支援 C-PHY 解碼,亦無開發計劃。

3. 是否支援 DSI-2?

A:不支援,本產品無法量測 DSI-2 規格內的 C-PHY 訊號,同時也不支援 DSI-2 的

VDC-M 影像壓縮格式。

4. 量測時是否會影響訊號品質?

A:外接的儀器量測必然會有部分的負載效應影響,我們這邊採用 End-tip 搭配 SMPM Coaxial Cable 的連接方式來降低對待測物干擾並提升訊號品質。

5. 是否有支援訊號發送 (Tx) 功能?

A:不支援訊號發送功能

6. 主機與探棒如何連接?

A: 主機僅能使用 Slot B 作為探棒連接槽,並注意主機前端的兩個 USB 插槽也需要 連接至 Way Station 上,且上方 USB 對應 Top Way Station,下方 USB 對應 Bottom Way Station,不可接錯,否則將無法量測。連接後請注意兩個 Way Station 燈號是 否皆有亮起紅燈跟綠燈各一。









7. 探棒與待測物如何連接?

Α:

①焊線:

<u> 軟板 FPC End-tip:</u>



# (請勿過度彎曲,避免軟板內部斷路)

使用 End-tip 以跳線的方式連接待測物,此時跳線長度必須少於5mm 以提升訊號品質。 若無法將跳線長度縮短在5mm內,建議在待測訊號端先焊接100Ω 電阻,再從該電阻 後跳線接至 End-tip 上,如此跳線可拉長至3cm 左右。

步驟一:先將 SMPM-SMPM cable 接上 End-tip, 確認有定位聲。

步驟二:再進行跳線焊接,這樣可避免焊接好之後插上 SMPM Cable 時影響跳線。 ※ End-tip 的 R1/R2 電阻是 1kΩ/0402,若焊線時不慎損毀,可自行替換。



將 R1, R2 焊上表中相對應之電阻, C1 焊上對應之電容,並依照 FPC End-tip 之步驟完成與待測物之連接





② <u>user-tip</u>:客戶自行依待測物形態設計專屬的 End-tip,只需用 1kΩ 連接待測訊號再以

50Ω特性阻抗的 PCB trace 接往 SMPM plug 即可,之後便可用 user-tip 取代 End-tip, 將 SMPM-SMPM cable 接到 user-tip 便可。

③使用 Breakout 方式連結: 自行設計 EV board 使用 SMPM Connector 連接 Acute MIPI D-PHY Analyzer 將 PCB 板上的 D-PHY Host 與 Device 連接斷開後改為上方 的結構, 左側接回到 D-PHY Host, 右側則接到 MIPI D-PHY Device。設計時 PCB 上面的 R1/2/3 盡量接在一起,並使用 50Ω 特性阻抗之走線, 完成後便可於下方使用 SMPM Connector 連接 Acute MIPI D-PHY Analyzer 進行量測。



 在跳好線之後,想用三用電表確認是否有短路發生,實際量了似乎有短路的現象, 如何釐清?

接線如下圖,



在地線接好之後,包含整個 Way Station、Probe 都接好,並先將 BusFinder 斷電。 量測點 <u>A</u>:End-Tip 電阻**前**端對地,綠色線==>電表不響。



量測點 <u>B</u>: End-Tip 電阻後端對地,紅色線==>電表會響,是否表示有焊接問題, 造成短路發生?

量測點 **B**電表會響為正常現象,是因為電阻後端對地只有 50Ω,阻抗低,一般電 表測短路功能一定會響。測量時,只要前端 1.05 KΩ 處對地不會響,這樣就沒有短 路問題發生。

9. 待测物如何接地?

由於設備與待測系統仍需共地,因此可先將 Way Station 上的 GND Port 連接至待 測物的 GND 即可,兩個 Way Station 都要接。

除非訊號品質太差或干擾太大,分析之後發生較多的錯誤時,則可改為每個 End-tip 都接地的效果最好。

#### 10. 有指令某個 Command 或 Data type 做為 trigger 點的功能嗎?

A:可以指定特定的 Data Type / DCS 或是 Error 進行觸發。



# 11. 是否可以自行設定一個 HS/LP 起始點(例如 DCS CMD),指定抓取多少時間內的 Data?

A:可以將起始條件設定在觸發項目後,到工作模式選單內調整為資料監控儀模式, 並指定擷取時間長度。



File Capture Cursor Connect Protocol Configuration No Support Waveforms Run Search All Field To bottom Window. Search Timestamp (hims:.ms.us.us.us.us.us.us.us.us.us.us.us.us.us	Acute BusFinder		NEAR STATE OF CONTRACTOR
Timestamp (h:ms:ma.wa.sa dut)       Configuration Settings         Operation mode       Protocol analyzer         Protocol logger       Station         Protocol logger       Wait for Stop         Wait for Trigger       Trigger Position < 50%         Protocol monitor       Stop immediately         Wait for Tig]       Stop immediately         Wait for Tig]       Stop immediately	File     Capture     Cu       Image: Connect     Image: Connect     Image: Connect     Connect	rsor infiguration No Support Waveforms Run	Search All Field
<ul> <li>Protocol analyzer</li> <li>Protocol logger</li> <li>Protocol logger</li> <li>Wait for Stop</li> <li>Wait for Trigger</li> <li>Trigger Position &lt;50% •</li> <li>When Triggered</li> <li>Fill device memory then stop</li> <li>Stop immediately</li> <li>Wait for 15 ÷ seconds then stop</li> </ul>	Timestamp (h:m:s.ms.us.ns dur)	Configuration Settings	×.
<ul> <li>Protocol logger</li> <li>Wait for Stop</li> <li>Wait for Trigger</li> <li>Trigger Position &lt;50%</li> <li>When Triggered</li> <li>Fill device memory then stop</li> <li>Stop immediately</li> <li>Wait for 15 ÷ seconds then stop</li> </ul>		• Protocol analyzer	BusFinder memory limitation
Protocol monitor      Fill device memory then stop      Stop immediately      Wait for 15 = seconds then stop		Protocol logger	<ul> <li>Wait for Stop</li> <li>Wait for Trigger</li> <li>Trigger Position &lt; 50%</li> <li>When Triggered</li> </ul>
		Protocol monitor	<ul> <li>Fill device memory then stop</li> <li>Stop immediately</li> <li>Wait for 15 + seconds then stop</li> </ul>

# 附錄一: Tearing Effect Signal

Tearing Effect (TE) 腳位訊號量測



(圖片來源: https://blog.csdn.net/kris\_fei/article/details/77775553)



TE 腳位是顯示屏用來告知 Host, 目前屏幕圖形繪製中, 不可以更新資料, 若在 TE = High 的情況更新屏幕, 則影像上會出現水平斷裂線, 此功能可以清楚的辨識出沒有依照 TE 狀態操作的指令, 減少猜測問題點以及另外架設示波器來驗證所需的時間 TE 功能需要使用者多添購一組 LA Probe 才能支援, 預設從通道 0 輸入, 支援 3.3V 以 及 1.8V 兩種工作電壓模式, 設定畫面如下,

Hoose Connection Hoose Connection How S 5.1 HO ACX HIPI D-PHY J2C HIPI D-PHY HIPI D-PHY J2C HIPI D-PHY HIPI D-PHY J2C HIPI D-PHY J2C HIPI D-PHY J2C HIPI D-PHY J2C HIPI D-PHY J2C HIPI D-PHY HIPI D-PHY	Lane Number		4 Lanes	▼ 觸發條件		
C 5.1 2C MIPI D-PHY Way Station 0 CSI DSI 3C SFFE SPMI D Flash us DD 1 1 D 1 D 2 1 D 2 D D 2 D D 2 D D 2 D D D D D D D D D D D D D	X X		Physical Connection	ECC Error (Sing	le-bit Error)	
2C       MIPI D-PHY Way Station       00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5.1 Acute	GND		ECC Error (Multi	-bit Error)	
Signal       Image: Signal	MIPI D-PH	Y D0-	± D0	CRC error		
Si S		D1- CLK+		External Trigger	In	
Acute MIPID-PHY s s s 10 10 10 10 10 10 10 10 10 10	SI (9)	CLK -		DSI Packet	0	
Image Setup       Image Setup         Flash is       Image Setup         Image Setup		GND		Filter Data >	48 bytes	
Mast       Way Station       D3       Clock Rate       Auto         Image: State of the state	MIPI D-PH	Y D2+	± D2	Timing Setup	- 10 59,05	
TCLK-SETILE Auto Phase D0 0 Tearing Effect Signal D1 0 D2 0 D3 0 CLK 0 D3 0 CLK 0 Phase D0 1 D1 0 D2 0 D3 0 CLK 0 Phase D0 1 D1 0 D2 0 D3 0 CLK 0 Phase D0 1 D1 0 D2 0 D3 0 CLK 0 Phase D1 0 D3 0 CLK 0 Phase D1 0 D2 0 D3 0 CLK 0 Phase D3 0 CLK 0 Phase D1 0 D2 0 D3 0 CLK 0 Phase D3 0 CLK 0 Phase D3 0 CLK 0 Phase D3 0 CLK 0 Phase D3 0 CLK 0 Phase D3 0 CLK 0 Phase D3 0 CLK 0 Phase D1 0 D2 0 D3 0 CLK 0 Phase D3 0 CLK 0 Phase D3 0 CLK 0 Phase Phase D1 0 D2 0 D3 0 CLK 0 Phase P	Way Statio	n D3+	± D3	Clock Rate	Auto	-
D0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	3otton			Phase	Auto	( <b>-</b> )
b comp diversion of the second	Tearing Effect Signal		/	D0	0	\$
1.8V (From Channel A0) D2 0 D3 0 CLK 0 Phase Adjustment				D1	0	\$
.1     D3     0       *Additional LA-Probe is required     CLK     0       Enable Waveform capture for connection verification (Beta)     Phase Adjustment			1.8V (From Channel A0)	D2	0	\$
*Additional LA-Probe is required CLK 0 Phase Adjustment Enable Waveform capture for connection verification (Beta)				D3	0	¢
Phase Adjustment Enable Waveform capture for connection verification (Beta)			*Additional LA-Probe is required	CLK	0	\$
Enable Waveform capture for connection verification (Beta)		-		Pha	se Adjustment	
	Enable Waveform cap	ture for con	nection verification (Beta)			

### 實際擷取畫面:

	Timestamp (himis ma.us.na dur)	Mode	V	Data Type	DCS (h)	WC	Data (h)	Direction	ECC (h)	CRC (h)	Pkt. No.	TE	aforma 🛎
4655	15:25:57.342	HS	3	DCS Long Write/w.	0	8385	08 FE B9 28 C9 D0 C6 C1	Host -> Dev_	37 (R	10	1	Changing	Incon
4656	15:25:57.342	HS	1	Turn On Peripher_			C9 1A	Host -> Dev_	37 (R	2	1	Changing	
4657	15:25:57.342	HS		Sector and Sector		1024	07 F8 DB F9 70 10 7C F7	he wanted	F9 (E	c		Second Second	
4658	15:25:57.343	HS	.0	End of Transmiss_			46 1E	Host -> Dev	3A (R	2	1	1	
4659	15:25:57.343	HS				1024	63 B8 21 B9 F0 42 60 B9	man and and and	89 (E	C	and the second	The second second	
4660	15:25:57.343	HS	0	Sync Event, V Sy_			11 A6	Host -> Dev_	3A (R	9	1	Changing	
4661	15:25:57.343	HS			and the second second second second	1024	59 82 10 F8 E4 01 D1 39		F8 (E	F			1000
4662	15:25:57.343	HS	1	DCS Short WRITE,_	3C (write memory	100000	21	Host -> Dev_	OF (R	9	1	Changing	
4663	15:25:57.343	HS				1024	36 34 18 B8 E8 40 80 B9		B8 (E	223			1000
4664	15:25:57.344	HS	0	Generic Long Wri-		33932	1C 1F 64 B7 8D 18 38 39	Host -> Dev_	39 (R		1	Changing	Incon
4665	15:25:57.344	HS				1024	56 8B AC 79 08 C9 22 E7		79 (E	Em			
4666	15:25:57.345	HS	2	Generic READ, no_		de seres s	64 80	Host -> Dev_	OF (R)		1	Changing	
4667	15:25:57.345	HS				1024	83 63 44 B8 25 B6 4C F9		B8 (E	5			1000
4668	15:25:57.347	HS	0	Sync Event, H Sy_	3		71 4C	Host -> Dev_	16 (R	B	1	1	
4669	15:25:57.347	HS				1024	D9 9C 30 B8 58 B3 F4 B6	and the second second	B8 (E	5		Sector sector sector	and the second second
4670	15:25:57.350	HS	1	Packed Pixel Str.		19580	C8 78 3C F6 A4 9E 76 38	Host -> Dev_	38 (R	1	1	Changing	Incos
4671	15:25:57.350	HS		a second and a second se		1024	6C 35 3A 88 BC 4E 50 F5	increase and	B8 (E	Em	1.2	Summer Prints	and the second second
4672	15:25:57.350	HS	3	Packed Pixel Str.		36924	A4 39 39 C2 A4 58 58 78	Host -> Dev.	34 (2)	2	1	Changing	Incos
4673	15:25:57.350	HS	100	and the second		1024	E4 E1 51 EA 2B 8C 14 B7	with the particular	EA (E	Con .	1	2 - 19 - 19 - 19 - 19 - 19 - 19 - 19 - 1	
4674	15:25:57.353	HS	2	Generic READ, 1 _			80 16	Host -> Dev_	3A (R	2 <sub>ei</sub>	1	0	
4675	15:25:57.353	HS		in a second s	· · · · · · · · · · · · · · · · · · ·	1024	82 F9 62 7C 2B 8C E1 B5	Marcola and a	7C (E	En:	1000	-	Clock
4676	15:25:57.353	HS	0	Picture Paramete.	(	4351	10 FF 4C F4 FF FF FF 00	Host -> Dev_	13 (R	24	2	1	Incon
4677	15:25:57.353	HS				1024	80 8C 11 84 20 70 5A 88	Alman in and	34 (E	Enr	1	- marine and	Clock
4678	15:25:57.354	HS	1	Packed Pixel Str.		27964	B8 64 OF 98 1C 98 98 78	Host -> Dev_	34 (R	Bay .	1	Changing	Incon
4679	15:25:57.354	HS				1024	64 60 88 B7 FB 7C 60 BA		B7 (E	Em			
4680	15:25:57.354	HS	-1	Facked Pixel Str_		62750	B7 CB 3F 26 FF A5 9F 00	Host -> Dev.	1D (R	2-m	1	Changing	Incos
4681	15:25:57.354	HS				4	68 6F 3A 34						
4682	15:25:57.354	HS	2	Shut Down Periph_			75 D1	Host -> Dev_	39 (R	B	2	1	
4683	15:25:57.354	HS				1024	6C 94 57 D1 E4 05 3A 93		D1 (E	Ever 1			
4684	15:25:57.356	HS	1	Packed Pixel Str.		17842	F9 7D D9 48 FD D4 43 00	Host -> Dev_	00 (R		1	Changing	Uncos
4685	15:25:57.356	HS				1024	BA 5D 9E 10 E4 12 AD 67		Surger of the				
4686	15:25:57.356	HS	3	Generic READ, 2 _		· · · · · · · · · ·	EE 83	Host -> Dev_	IA (R	b	1	Changing	
4687	15:25:57.356	HS	1.00			1024	B8 9C 7A 10 58 E8 E3 58		and the second			1	
4688	15:25:57.357	HS	2	Picture Paramete.		23429	4F 48 8C 58 CA 45 5E 70	Host -> Dev_	LA (R	2	1	Changing	Incon
4689	15:25:57.357	HS				1024	28 BC 29 B3 35 24 B1 76		B3 (E	E-m	1.000	and a state of the	
4690	15:25:57.357	HS	3	Packed Pixel Str.	1	32748	BC B4 B8 1B DC 04 E8 59	Host -> Dev_	3A (R)	2	1	Changing	Incos
4691	15:25:57.357	HS	1	Null Packet, no _		12039	C9 C5 9C F4 59 C8 42 F7	Host -> Dev_	IA (R	in the second se	1	Changing	Uncon-
1													<b>P</b>



# 附錄二:影像還原功能

點選視窗->Video Display Dialog, 可開啟影像還原功能,

File	Capture Cursor											- 1			1						
Conr	nect Protocol Protocol	() Analyzer	No Support	Waveform	ms	Run Q	earch All Field earch		/ 150765	75 To bo	tum Window	Save to text	Stack DSO							τι	unning
	Timestamp (himis)		Mode	we	Date	a Time	DCS (b)		-	Data	C Rep	port List		-6	87C (b)	CRC (b)	Dkt No.	Information	Navigator		3
1							0.05 (II)			Juca	Shi	w Both Report w Show Main Repor	t Report		(II)			*** Capture St	Discription     Sampled	Txns 10991	Bytes
2	11:48:14.9	6.815.	. HS	0	DCS	Short WRITE, no	- 11 (exi	t_sleep_mode)		00	She	w Show Secondary	Report Report	_	36 (OK)		1		<ul> <li>DSI Error</li> <li>DSI Bus</li> </ul>	0	
4	11:48:15.1	6.584.	. HS	0	Syne	ic Event, V Sync	S			00 00	i Vid	so Display Dialog	_	_	07 (OK)		1		Packet C	15076566	
5	11:48:15.1	6.600.	. HS . HS	0	Syna	ic Event, H Sync ic Event, H Sync	S S			00 00			Host -> Dev	ice	12 (OK) 12 (OK)		1				
7	11:48:15.1	6.609.	HS HS	0	Synd	ic Event, H Sync	S		_	00 00			Host -> Dev	ice	12 (OK)		1				
9	11:48:15.1	6.625	HS	0	Syne	c Event, H Sync	S			00 00			Host -> Dev	ice	12 (OK)		1				
10	11:48:15.1	6.633. 6.641	. HS . HS	0	Syne	ic Event, H Sync ic Event, H Sync	S S			00 00			Host -> Dev Host -> Dev	ice ice	12 (OK) 12 (OK)		1				
12	11:40:15.1	6.641	. HS	0	Null	1 Packet, no da	a		1	00			Host -> Dev	ice	13 (OK)	0F87 (OK)	2				
14	11:48:15.1	6.641	. 85	0	Null	1 Packet, no da	a		1	00			Host -> Dev	ice	13 (OK)	0F87 (OK)	4				
15 16	11:48:15.1	6.641	. HS . HS	0	Nul: Nul:	1 Packet, no da 1 Packet, no da	a		1	00			Host -> Dev Host -> Dev	1ce 1ce	13 (OK) 13 (OK)	0F87 (OK) 0F87 (OK)	5				
17	11:48:15.1	6.641	. HS	0	Null	1 Packet, no da	a		1	00			Host -> Dev	ice	13 (OK)	0F87 (OK)	7				м
19	11:48:15.1	6.642	. HS	0	Null	l Packet, no da	a		1	00			Host -> Dev	ice	13 (OK)	0F87 (OK)	9		×		
20 21	11:48:15.1	6.642	. HS . HS	0	Null	1 Packet, no da 1 Packet, no da	a		1	00			Host -> Dev Host -> Dev	ice ice	13 (OK) 13 (OK)	0F87 (OE) 0F87 (OE)	10		Statistics Tx	15	Bytes
22	11:40:15.1	6.642	. HS	0	Null	1 Packet, no da	a		1	00			Host -> Dev	ice	13 (OK)	0F87 (OE)	12				
25	11:40:15.1	6.642	. HS	0	Null	1 Packet, no da	a		1	00			Host -> Dev	1ce	13 (OK) 13 (OK)	0F87 (OK)	13				
25 26	11:48:15.1	6.642	. HS . HS	0	Nul: Nul:	1 Packet, no da 1 Packet, no da	a		1	00			Host -> Dev Host -> Dev	1ce 1ce	13 (OK) 13 (OK)	0F87 (OK) 0F87 (OK)	15				
27	11:48:15.1	6.642	. HS	0	Null	1 Packet, no da	a		1	00			Host -> Dev	ice	13 (OK)	0F87 (OK)	17				
29	11:48:15.1	6.642	. HS	0	Null	l Packet, no da	a		1	00			Host -> Dev	ice	13 (OK) 13 (OK)	0F87 (OK)	10				
30 31	11:48:15.1	6.642	. HS . HS	0	Null	1 Packet, no da 1 Packet, no da	a		1	00			Host -> Dev Host -> Dev	ice ice	13 (OK) 13 (OK)	0F87 (OE) 0F87 (OE)	20				
32	11:40:15.1	6.642	. HS	0	Null	1 Packet, no da	a		1	00			Host -> Dev	ice	13 (OK)	0F87 (OE)	22				
34	11:40:15.1	6.642.	. HS	0	Null	1 Packet, no da	a		1	00			Host -> Dev	1ce	13 (OK) 13 (OK)	0F87 (OK)	23				
35 36	11:48:15.1	6.642.	. HS . HS	0	Nul: Nul:	1 Packet, no da 1 Packet, no da	a		1	00			Host -> Dev Host -> Dev	ice ice	13 (OK) 13 (OK)	0F87 (OK) 0F87 (OK)	25				
37	11:48:15.1	6.642	. HS	0	Null	1 Packet, no da	a_		1	00			Host -> Dev	ice	13 (OK)	0F87 (OK)	27				
39	11:48:15.1	6.642.	. HS	0	Null	l Packet, no da	a		1	00			Host -> Dev	ice	13 (OK) 13 (OK)	0F87 (OK)	20		-		) <u>) (</u>
																		<u>4</u>	Detail Naviga	tor Hide Item	64
	Video Display Dial	g																		×	
Ir	nage Porch																				
	)isplav Settings																		💾 Save Image		
							_					_							Save mage		
	Туре			24bit	tRG	GB 8-8-8	-		•	0/0		8						90' 90'			
								_													
	Width			108	0		-														
	Height			192	0		-														
	-																				
	R-G-B Order			R.C.	R		T														
	It o b older				-																
	Show partial upd	oto																			
	billow portion ope	auc																			
	Pro Pro	cess				Sto	0														
																		Info	ormation		
																			Exit		

請設定待測物送出的 DSI, CSI 格式, 解析度, RGB order, 再按下 Process 即可開始還 原影像, 。另提供部分解析功能, 若待測物僅更新部分螢幕時, 可將此項勾選, 將顯示部 分更新內容。



### 影像還原實例:

📔 Video Display Dialog				×
Image Porch				
Display Settings				💾 Save Image
Туре	24bit RGB 8-8-8	42/118 > )	90 90	
Width	1080			
Height	1920	兼 SM 卡		
R-G-B Order	R-G-B	12:49		
Show partial update		己薹牛參用山四		
Process	Stop	① 条兆 尚太安第 SM キ 子TUIS 朱容 大部 ① TOUCH D 原法作此 Phone 上数用 Touch D -	I	information Width = 1080 Height = 1920
				Exit

並提供與主報告區之資料作連動功能,方便找尋影像資料位置。 Save Image 可將還原影像以.jpg / .bmp / .bin 方式輸出。

DSI 若以 Video mode 傳送影像資料,也有提供 Porch 功能可統計每張影像所送出的格式,

可統計 VSA, VBP, VFP, HBP, HFP, image 的功能

若選擇 TYPE – DSC 還原, 使用 DCS Command 請選擇 DSC Command mode, 若使 用 VSync, HSync 格式請選擇 DSC Video mode, 並請給定 PPS 檔案(格式為.txt), 才能 還原。 PPS 亦會隨著 Picture Parameter Set (0A)指令替換。



# 附錄三: 無法量測/僅量測到 LP mode 訊號/大量錯誤產生解決方法:

Step 1: 請檢查探棒與主機間的 2 條 USB 是否有沒接好或接觸不良問題

• 將主機端與 WayStation 端的 USB 拔除再重新插回

Step 2: 請檢察 Lane/CLK 的焊線是否有在規定內之 5mm 內, 並確認每個 End-tip 都有 接上 Gnd,

Step 3: 開啟波形檢視功能並送出 HS 訊號, 用以確定接線正常,

Step 3.1: 開啟波形檢視功能



Step 3.2: 切換模式, 使用 Protocol Monitor mode 並縮小記憶體,





# Step 3.3: 開啟波形視窗



#### 

Step 3.5: 分析是否有 HS 訊號, 紅色箭頭"前"波形為 LP, "後"則為 HS 訊號, 請找到相似 位置並將其波形放大檢視, 若重複擷取數次仍無法找到 LP, HS 波形或有少 Lane/CLK 的情況, 可能原因為 Lane/CLK 沒接通, 請見 FAQ 第七點,







Step 3.6: 確認 CLK Duty 是否為 50:50, 並檢查 HS SYNC 1D 後方之 Lane 0-3 的每一個 edge 寬度,正常為半個 CLK cycle 的寬度或其倍數,如非正常,請再次檢查 焊線是否符合規定, 若符合規定,仍會有雜訊或是 CLK Duty 問題,請繼續縮短焊線長度, Gnd 也就

近引入,



### Ex: CLK duty 不好情况, 65:35, 1.4ns:0.8ns

Ex: Lane 0, Lane 3 不為半個 CLK cycle 的寬度

Half CLK cycle = (1.4 + 0.8) / 2 = 1.1 (ns)

正常的 Data 波形約 1.1ns 或其倍數





附錄四:還原影像列表

1. Video mode - 1125 \* 2436





# 2. CMD mode - 1125 \* 2436

