

BF7264B/B+/Pro MIPI D-PHY

方案说明



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概况:

支援型号:

BF6264B	BF7264B	BF7264B+	BF7264 Pro
	•	•	•

BF7264B/B+/Pro 产品正面有两个 USB 孔

除主机可继续使用原 BF6264B 功能外,增加 MIPI D-PHY 分析仪功能。

MIPI D-PHY 方案,规格内容如下:



2. 支持 D-PHY V1.2

Up to 2.0Gbps per lane , 1 + 4 Lanes





压

3. 可显示 CSI-2 1.3 或 DSI 1.3 协议封包资料以表格方式呈现,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 1	LP (LPDT)	0	Generic Long Wri		2	B0 03	Host proces	00	(OK)	F84D	(OF
11	10.637.060.1 1	LP (LPDT)	0	DCS Short WRITE,	53 (write_control_display)		24	Host proces	08	(OK)		
12	10.637.066.5 1	LP (LPDT)	0	DCS Short WRITE,	35 (set_tear_on)		00	Host proces	2F	(OK)		
13	10.637.083.3 1	LP (LPDT)	0	Generic Long Wri		2	B0 04	Host proces	00	(OK)	8CF2	(OF
14	10.637.105.0 1	LP (LPDT)	0	Generic Long Wri		3	EB 00 83	Host proces	1A	(OK)	AFA7	(OF
15	10.637.124.2 1	LP (LPDT)	0	Generic Long Wri		2	FB 00	Host proces	00	(OK)	6818	(OF
16	10.637.179.2 1	LP (LPDT)	0	Generic Long Wri		20	C8 01 00 04 FB FC CD 00	Host proces	19	(OK)	B76A	(OF
17	10.637.196.0 1	LP (LPDT)	0	Generic Long Wri		2	D6 01	Host proces	00	(OK)	EADA	(OF
18	10.637.208.8 1	LP (LPDT)	0	Generic Long Wri		2	B0 03	Host proces	00	(OK)	F84D	(OF
19	10.637.219.1 1	LP (LPDT)	0	DCS Short WRITE,	<pre>11 (exit_sleep_mode)</pre>		00	Host proces	36	(OK)		
20	10.837.205.4 1	LP (LPDT)	0	DCS Short WRITE,	29 (set_display_on)		00	Host proces	1C	(OK)		
21	10.870.540.9 1	LP (LPDT)	0	DCS Short WRITE,	<pre>51 (set_display_brightness)</pre>		FE	Host proces	0D	(OK)		
22	10.870.560.9 1	LP (LPDT)	0	DCS READ, no par	DA		00	Host proces	1F	(OK)		
23	10.870.562.6 1	BTA										
24	10.870.571.3 1	LP (LPDT)	0	DCS Short READ R			E1 00	Peripheral	27	(OK)		
25	10.870.573.4 1	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 1	HS	0	End of Transmiss			OF OF	Host proces	01	(OK)		
28	10.897.134.6 1	HS	0	DCS Long Write/w	<pre>3C (write_memory_continue)</pre>	2881	CA 1B CC EC 7A 5C 55 D2	Host proces	04	(OK)		
29	10.897.134.6 1	HS	0	End of Transmiss			OF OF	Host proces	01	(OK)		
30	10.897.153.2 1	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 1	HS	0	End of Transmiss			OF OF	Host proces	01	(OK)		
32	10.897.171.7 1	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 1	HS	0	End of Transmiss			OF OF	Host proces	01	(OK)		
34	10.897.190.2 1	HS	0	DCS Long Write/w	<pre>3C (write_memory_continue)</pre>	2881	BA 15 C3 CF E5 B8 1E 6D	Host proces	04	(OK)		
1.100		11.0		100 100					1.0.0	CONTROL 1		

4. 使用 32Gb RAM 搭配硬盘串流来储存 D-PHY 通讯资料,可完整节录待测物从 Low Power Mode 初始化到 High Speed Mode 的流程

11X 1 X 1 E (101-12)		
解析度	可撷取影像量	备注
1K (FHD 1080x1920)	约 500 Frame	
2K (WQHD	約 280 Frame	
1440x2560)		
	約 120 Frame	需要 8 Lane 或是 4 Lane 带有 DSC
4K (UHD 2100X3640)		缩
8K (4320x8192)	不支持	不支持

可撷取资料量 (以未启用硬盘串流来估算)

- 5. 提供 Data Filter 功能,可将不必要的影像资料滤除以节省內存
- 6. 提供 Search 资料功能
- 7. 提供 ECC/CRC Packet 计算及错误显示
- 可显示 DSI、CSI 影像资料,包含 RGB、YCbCr、RAW 格式,以及压缩的 DSC 类型之封包,并统计 Porch 数据。详细信息请参考附录二。



isplay Set	ttings	📉 📢 🥞 93/93 🕨 🔰 🆙 🤝 Save Image
Туре	24bit RGB 8-8-8	
Width	1080 👻	₩. SM.+*
Height	2340 *	12:49
R-G-B Ord	der R-G-B	
		的不安哉 SM 十 图19日间: 电多句符
		① TOLCHID 触起存出 Phone 上設用 Touch ID *
	Pause Stop	
		Information



 D-PHY 命令统计功能,包含封包总数、各别指令数量、以长度分类的指令统计以及 错误数量统计



Discription	Txns	Bytes	Statistics	Txns	Bytes	4
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 命令触发功能

a. 触发参数包含命令与参数资料可输入 32 bytes 的资料做为触发条件.
 可涵盖所有 Short Packet, 以及大部分非影像资料的 Long Packet
 Short Packet 长度 4bytes Header

Long Packet 长度 4bytes Header + 28byte Data

- b. 可触发 CRC/ECC Error
- C. 可透过 Trigger-Out 接孔同步触发外部的示波器

11.TE 通道侦测 (Tearing Effect)

 Tearing Effect Signal 	
LA	1.8V (From Channel A0) *Additional LA-Probe is required

可侦测屏幕所发送 TE 信号,须加购 LA Probe 方能使用此功能。 详细说明请参考附录一。



FAQ

1. 支持 MIPI DSI 第几版的规格,是否有 Differential 对数或 port 数限制呢?

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

2. 是否有支持 C-PHY 解码呢?

A:不支持 C-PHY 解码,亦无开发计划。

- 3. 是否支持 DSI-2?
 - A:不支持,本产品无法量测 DSI-2 规格的内部 C-PHY 信号,同时也不支持 DSI-2 的 VDC-M 影像压缩格式。
- 4. 量测时是否会影响信号品质?

A:外接的仪器量测必然会有部分的负载效应影响,我们这边采用 End-Tip 搭配 SMPM Coaxial Cable 的连接方式来降低对待测物干扰并提升信号品质。

5. 是否有支持信号发送 (Tx) 功能?

A:不支持信号发送功能

6. 主机与探头如何连接?

A: 主机仅能使用 Slot B 作为探头连接槽,并注意主机前端的两个 USB 插槽也需要 连接至 Way Station 上,且上方 USB 对应 Top Way Station,下方 USB 对应 Bottom Way Station,不可接错,否则将无法量测。连接后请开启软件,选择协议分析仪 D-PHY DSI/CSI,并请注意两个 Way Station 灯号是否皆有亮起红灯跟绿灯各一。









7. 探头与待测物如何连接?

A:①<u>焊线</u>:

<u> 軟板 FPC End-tip:</u>



(请勿过度弯曲,避免软板内部断路)

使用 End-tip 以跳线的方式连接待测物,此时跳线长度必须少于 5mm 以提升信号品质。

若无法将跳线长度缩短在 5mm 内,建议在待测信号端先焊接 100Ω 电阻,再从该电阻 后跳线接至 End-tip 上,如此跳线可拉长至 3cm 左右。

步骤一:先将 SMPM-SMPM cable 接上 End-tip,确认有定位声。

步骤二:再进行跳线焊接,这样可避免焊接好之后插上 SMPM Cable 时影响跳线。 ※ End-tip 的 R1/R2 电阻是 1kΩ/0402,若焊线时不慎损毁,可自行替换。



将 R1, R2 焊上表中相对应之电阻, C1 焊上对应之电容, 并依照硬板之步骤完成与待测物之连接





②<u>user-tip</u>:客户自行依待测物形态设计专属的 End-tip,只需用 1kΩ 连接待测信 号再以 50Ω 特性阻抗的 PCB trace 接往 SMPM plug 即可,之后便可用 user-tip 取 代 End-tip,将 SMPM-SMPM cable 接到 user-tip 便可。

③使用 Breakout 方式连结: 自行设计 EV board 使用 SMPM Connector 连接 Acute MIPI D-PHY Analyzer 将 PCB 板上的 D-PHY Host 与 Device 连接断开后改为上方 的结构, 左侧接回到 D-PHY Host, 右侧则接到 MIPI D-PHY Device。设计时 PCB 上面的 R1/2/3 尽量接在一起,并使用 50Ω 特性阻抗之走线,完成后便可于下方使 用 SMPM Connector 连接 Acute MIPI D-PHY Analyzer 进行量测。



8. 在跳好线之后,想用三用电表确认是否有短路发生。



量测点 <u>A</u>:End-Tip 电阻**前**端对地,绿色线==>电表不响。 量测点 <u>B</u>:End-Tip 电阻后端对地,红色线==>电表会响,是否表示有焊接问题,

造成短路发生?



量测点 **B**电表会响为正常现象,是因为电阻后端对地只有 50Ω,阻抗低,一般电 表测短路功能一定会响。测量时,只要前端 1.05 KΩ 处对地不会响,这样就没有短 路问题发生。

9. 待测物如何接地?

由于设备与待测系统仍需共地,因此可先将 Way Station 上的 GND Port 连接至待 测物的 GND 即可,两个 Way Station 都要接。

除非信号品质太差或干扰太大,分析之后发生较多的错误时,则可改为每个 End-tip 都接地的效果最好。

10. 有指令某个 Command 或 Data type 做为 trigger 点的功能吗?

A:可以指定特定的 Data Type / DCS 或是 Error 进行触发。

INCER				Luis Jer Jil				
	Lane Number Probe Connection	4 Lanes		。 ECC Error ((Single-bit Err	or)		
NUX IC 5.1	Acute GND	Physical Connect	ion	 ECC Error CRC error External Tri 	(Multi-bit Erro gger In	n		
120	MIPI D-PHY	± D0	•	 DSI Packet 				
	Way Station D1+	± D1	🔠 DSI Trigger Setting	gs			?	
)	CLK+ CLK+		Transmission Type	HS or LP				
CSI DSI		{	方向通道	Host Sou	irced	O Periphe	eral Sourced	
I3C REFE	GND		Data Type	XXh, Any Ho	st Sourced Da	ita Type		
SPMI	MIPI D-PHY		DCS	XXh, Any DC	S			
bus D Flash		± D2	Header					-
lus	Way Station	± D3	VC/DT	Any VC	▼ XXh			1
A l	Bott		Data 0	XXh				
0	Om) B	J	Data 1	XXh				Ī
	Tearing Effect Signal		ECC	XXh				
lus			Data					
)		1.8V (From Channel A(Byte 0-3	XXh	XXh	XXh	XXh	ī
			Byte 4-7	XXh	XXh	XXh	XXh	1
1.1 PD		*Additional LA-Probe	Byte 8-11	XXh	XXh	XXh	XXh	
			Byte 12-15	XXh	XXh	XXh	XXh	
	Enable Waveform capture for con	onection verification (Beta)	Byte 16-19	XXh	XXh	XXh	XXh	
	chubic transionin capture for con	incention vermeation (Deta)	Byte 20-23	XXh	XXh	XXh	XXh	
			Byte 24-27	XXh	XXh	XXh	XXh	Ĩ

11. 是否可以自行设置一个 HS/LP 起始点(例如 DCS CMD),指定抓取多少时间内的 Data?

A:可以将起始条件设置在触发项目后,到工作模式选单内调整为资料监控仪模式, 并指定撷取时间长度。



🛤 Acute BusFinder		REAL OF A CONTRACTOR OF A CONT
File Capture Cur	rsor	
Connect Protocol Co	nfiguration No Support Waveforms	Search All Field To bottom Window, Save to
Timestamp (h:m:s.ms.us.ns dur)	Configuration Settings	
	Operation mode	_
	• Protocol analyzer	
		BusFinder memory limitation
		50%
	• Protocol logger	 Wait for Stop
		Wait for Trigger
		Trigger Position < 50%
		When Triggered
	Protocol monitor	 Fill device memory then stop
		Stop immediately
	DATA	
		O Default

附录一: Tearing Effect Signal

Tearing Effect (TE) 脚位信号量测



(图片来源: https://blog.csdn.net/kris_fei/article/details/77775553)



TE 脚位是显示屏用来告知 Host, 目前屏幕图形绘制中,不可以更新数据,若在 TE = High 的情况更新屏幕,则影像上会出现水平断裂线,此功能可以清楚的辨识出没有依照 TE 状态操作的指令,减少猜测问题点以及另外架设示波器来验证所需的时间 TE 功能需要用户多添购一组 LA Probe 才能支持,默认从通道 0 输入,支持 3.3V 以及 1.8V 两种工作电压模式,设置画面如下,

🔚 协议设置					×
10BaseT1S BiSS	_ane Number	4 Lanes	触发条件		
CAN F DALI DP-AUX	Probe Connection	Physical Connection	ECC Error (Single-bit E	rror)	
eDP eMMC 5.1	GND		ECC Error (Multi-bit Err	or)	
HID_I2C I2C	MIPI D-PHY	± D0	CRC error		
I2S LIN MDIO	Way Station	± D1 🔽	External Trigger In		
MII MIPI CSI	Lob)		DSI Packet	0	
MIPI I3C MIPI RFFE	GND		Filter Data >	48 bytes	
MIPI SPMI Modbus NAND Flash	MIPI D-PHY D2-	± D2 💌	Timing Setup		
PMBus Profibus	Way Station	± D3 💌	Clock Rate T CLK-SETTLE	Auto	•
PWM SD 3.0 SD 4.0	JSB NC		Phase	0	
SGMII SMBus	Tearing Effect Signal		D1	0	•
SVID UART		1.8V (From Channel A0)	D2	0	•
UFS USB 1.1 USB PD	LA	*Additional LA-Probe is required	D3 CLK	0	÷
000 PD			Phase Adju	stment	
	Enable Waveform capture for con	nection verification (Beta)			
C	默认			✔ 确定	★取消

实际撷取画面:

	Timestamp (himis ma.us.na dur)	Mode	VC	Data Type	DCS (h)	WC	Data	a (h.)	Direction	ECC	(h)	CRC (h)	Pkt. No.	TE	aforms_
4655	15:25:57.342	HS	3	DCS Long Write/w.	C0	8385	08	FE 89 28 C9 D0 C6 C1	Host -> Dev_	37	(Re		1	Changing	Uncon
4656	15:25:57.342	HS	1	Turn On Peripher_			C9	1A	Host -> Dev_	37	(Re.		1	Changing	
4657	15:25:57.342	HS				1024	07	F8 DB F9 70 10 7C F7	he as and the	F9	(Er	1		a succession of the second	
4658	15:25:57.343	HS	.0	End of Transmiss_		1100	46	18	Host -> Dev	3A	(Re		1	1	
4659	15:25:57.343	HS		li anno ann an an ann an an an an an an an an a		1024	63	B8 21 B9 F0 42 60 B9	Sec. Sec. Sec. Sec. Sec. Sec. Sec. Sec.	89	(Er				
4660	15:25:57.343	HS	0	Sync Event, V Sy_		10000	11	A6	Host -> Dev_	3A	(Re		1	Changing	
4661	15:25:57.343	HS		1		1024	59	82 10 F8 E4 01 D1 39		F8	(Er				1000
4662	15:25:57.343	HS	1	DCS Short WRITE,_	3C (write memory		21		Host -> Dev_	0F	(Re_	3	1	Changing	
4663	15:25:57.343	HS				1024	36	34 18 B8 E8 40 80 B9		B 8	(Er.,				
4664	15:25:57,344	HS	0	Generic Long Wri-		33932	2 10	1F 64 B7 8D 18 38 39	Host -> Dev_	39	(Re		2	Changing	Incon
4665	15:25:57.344	HS				1024	56	8B AC 79 08 C9 22 E7		79	(Er.,	la constant de la con			
4666	15:25:57.345	HS	2	Generic READ, no_			64	80	Host -> Dev_	OF	(Re		1	Changing	
4667	15:25:57.345	HS				1024	83	63 44 B8 25 B6 4C F9		B8	(Er_				Contraction of the
4668	15:25:57.347	HS	0	Sync Event, H Sy_			71	4C	Host -> Dev_	16	(Re	-	1	1	
4669	15:25:57.347	HS				1024	D9	9C 30 88 58 83 F4 86	and the second second second	88	(Er.,			and the second second	and the second second
4670	15:25:57.350	HS	1	Packed Pixel Str.		19580	0 C8	78 3C F6 A4 9E 76 38	Host -> Dev_	38	(Re.		1	Changing	Incos
4671	15:25:57,350	HS		in the second		1024	6C	35 3A 88 BC 4E 50 F5	A DECKER AND A DECKER AND A	88	(Er.,	land the second second	1	C Parameters	
4672	15:25:57.350	HS	3	Packed Pixel Str.		36924	4 A4	39 39 C2 A4 58 58 78	Host -> Dev_	34	(Re.			Changing	Incos
4673	15:25:57.350	HS		in the second second		1024	E4	E1 51 EA 2B 8C 14 B7	Section 2. Section 2.	EA	(Er	1		8 8	
4674	15:25:57.353	HS	2	Generic READ, 1 _			80	16	Host -> Dev_	3A	(Re.			0	
4675	15:25:57.353	HS	-	a second second second second	1	1024	82	F9 62 7C 2B 8C E1 B5	Announce and and the	70	(Er			0	Clock
4676	15:25:57.353	HS	0	Picture Paramete.		4351	10	FF 4C F4 FF FF FF 00	Host -> Dev_	13	(Re		12	1	Incon
4677	15:25:57.353	HS		in the second		1024	80	8C 11 84 20 70 5A 88	and the second s	34	(Er			a succession of	Clock
4678	15:25:57.354	HS	1	Packed Pixel Str.		27964	4 B8	64 OF 98 1C 98 98 78	Host -> Dev	34	(Re		-	Changing	Incon
4679	15:25:57.354	HS				1024	64	60 88 B7 FB 7C 60 BA		87	(Er				
4680	15:25:57.354	HS	1	Facked Pixel Str.		62750	0 B7	CB 3F 26 FF A5 9F 00	Host -> Dev_	10	(Re.,		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	(Re		1	1	
4683	15:25:57.354	HS				1024	6C	94 57 D1 E4 05 3A 93		D1	(Er.			in Receiption	
4684	15:25:57.356	HS	1	Packed Pixel Str.		17842	2 F9	7D D9 48 FD D4 43 00	Host -> Dev_	00	(Re.			Changing	Incos
4685	15:25:57.356	HS				1024	BA	SD 9E 10 E4 12 AD 67		211000	1111		1	an anna an	
4686	15:25:57.356	HS	3	Generic READ, 2 _			EE	83	Host -> Dev_	1A	(Re			Changing	
4687	15:25:57.356	HS		Contraction and the second		1024	BB	9C 7A 10 58 E8 E3 58	No co- conserves		0.000	1		and the second se	and the second second
4688	15:25:57.357	HS	2	Picture Paramete.		23429	9 4F	48 8C 58 CA 45 5E 70	Host -> Dev_	18	(Re		3	Changing	Incon
4689	15:25:57.357	HS		Contraction of the second second		1024	28	BC 29 B3 35 24 B1 76	Contraction of the second second	B 3	(Er.,			Second Second	and the second
4690	15:25:57.357	HS	3	Packed Pixel Str.		32748	8 BC	B4 B8 1B DC 04 E8 59	Host -> Dev_	3A	(Re.		1	Changing	Incos
4691	15:25:57.357	HS	1	Null Packet, no _		12039	9 09	C5 9C F4 59 C8 42 F7	Host -> Dev_	1A	(Re	a second second	5	Changing	Uncon-
Contraction of the local division of the loc		-		and the second design of the second			-		a contraction of the second						1



附录二:影像还原功能

点选窗口->Video Display Dialog, 可开启影像还原功能,

File	Capture Cursor				1		
U U	Rus 🛝	Search All Field	1 / 15076575				Tunning
Connec	t Protocol Protocol Analyzer No Su	upport Waveforms Run Search	∧ ∨ To bothim Window, Save to text	Stack DSO			
	Timestamp (h:n:s.ms.us.nrMode	VC Data Type DCS (h)	WC Data (I) Show Both Report		ZCC (h) CRC (h)	Pkt. No. Information	Navigator (2)
1			Show Show Main Re	ort Report		*** Capture St	Sampled 10991
2 3	11:48:14.976.815 HS 11:48:15.110.253 HS	0 DCS Short WRITE, no _ 11 (exit_s 0 DCS Short WRITE, no _ 29 (set di	splay on) 00 Show Show Seconda	ry Report Report	1C (OK)	1	 DSI Error 0 DSI Bus
4	11:48:15.116.584 HS	0 Sync Event, V Sync S	00 00		07 (OK)	1	Packet C 150/6566
6	11:48:15.116.600 HS	0 Sync Event, H Sync S	00 00	Host -> Device	12 (OK)	1	
7 8	11:48:15.116.609 HS 11:48:15.116.617 HS	0 Sync Event, H Sync S 0 Sync Event, H Sync S	00 00	Host -> Device Host -> Device	12 (OK) 12 (OK)	1	
9	11:48:15.116.625 HS	0 Sync Event, H Sync S_	00 00	Host -> Device	12 (OK)	1	
10	11:48:15.116.633 HS 11:48:15.116.641 HS	0 Sync Event, H Sync S 0 Sync Event, H Sync S	00 00	Host -> Device Host -> Device	12 (OK) 12 (OK)	1	
12	11:40:15.116.641 HS	0 Null Packet, no data	1 00	Host -> Device	13 (OK) 0F87 (OK)	2	
14	11:48:15.116.641 HS	0 Null Packet, no data_	1 00	Host -> Device	13 (OK) 0F87 (OK)	4	
15	11:48:15.116.641 HS 11:48:15.116.641 HS	0 Null Packet, no data 0 Null Packet, no data	1 00	Host -> Device Host -> Device	13 (OK) 0F87 (OK) 13 (OK) 0F87 (OK)	6	
17	11:48:15.116.641 HS	0 Null Packet, no data_	1 00	Host -> Device	13 (OK) 0F87 (OK)	7	н
18	11:48:15.116.642 HS	0 Null Packet, no data 0 Null Packet, no data	1 00	Host -> Device	13 (OK) 0F87 (OK) 13 (OK) 0F87 (OK)	9	
20	11:48:15.116.642 HS	0 Null Packet, no data.	1 00	Host -> Device	13 (OK) 0F87 (OK)	10	Statistics Txns Bytes
22	11:48:15.116.642 HS	0 Null Facket, no data	1 00	Host -> Device	13 (OK) 0F87 (OK)	12	
23 24	11:48:15.116.642 HS 11:48:15.116.642 HS	0 Null Packet, no data 0 Null Packet, no data	1 00	Host -> Device Host -> Device	13 (OK) 0F87 (OK) 13 (OK) 0F87 (OK)	13	
25	11:48:15.116.642 HS	0 Null Packet, no data_	1 00	Host -> Device	13 (OK) 0F87 (OK)	15	
27	11:48:15.116.642 HS	0 Null Packet, no data.	1 00	Host -> Device	13 (OK) 0F87 (OK)	17	
28 29	11:48:15.116.642 HS 11:48:15.116.642 HS	0 Null Packet, no data 0 Null Packet, no data	1 00	Host -> Device Host -> Device	13 (OK) 0F87 (OK) 13 (OK) 0F87 (OK)	18	
30	11:48:15.116.642 HS	0 Null Packet, no data_	1 00	Host -> Device	13 (OK) 0F87 (OK)	20	
31	11:48:15.116.642 HS	0 Null Packet, no data	1 00	Host -> Device	13 (OK) 0F87 (OK)	21 22	
33	11:48:15.116.642 HS	0 Null Packet, no data	1 00	Host -> Device	13 (OK) 0F87 (OK)	23	
35	11:48:15.116.642 HS	0 Null Packet, no data_	1 00	Host -> Device	13 (OK) 0F87 (OK)	25	
36 37	11:48:15.116.642 HS 11:48:15.116.642 HS	0 Null Packet, no data 0 Null Packet, no data	1 00	Host -> Device Host -> Device	13 (OK) 0F87 (OK) 13 (OK) 0F87 (OK)	26	
38	11:48:15.116.642 HS	0 Null Packet, no data.	1 00	Host -> Device	13 (OK) 0F87 (OK)	28	
39 H	11.40.13.110.042 113	o Mull Packet, no data_	1 00	noat -> bevice	13 (OK) 0107 (OK)	27 J	Detail Nevigator Hide Items
🕍 Vi	deo Display Dialog						×
Ima	age Porch						
Dis	solay Settings						Com Tanan
							D save muße
	Туре	24bit RGB 8-8-8	🚺 ┥ o/o 🕨 🔰 🔞			90' 90'	
	Width	1080 💌					
		B					
	Height	1920					
	reight	1320					
	R-G-B Order	R-G-B					
	Show partial update						
	Process	Stop					
						Info	rmation
							Evit

请设置待测物送出的 DSI, CSI 格式, 分辨率, RGB order, 再按下 Process 即可开始还 原影像,。另提供部分解析功能, 若待测物仅更新部分屏幕时, 可将此项勾选, 将显示部 分更新内容。



影像还原实例:

🔛 Video Display Dialog				×
Image Porch				
Display Settings				💾 Save Image
Туре	24bit RGB 8-8-8		90' 90'	
Width	1080			
Height	1920	th: SIM +		
R-G-B Order	R-G-B	1 <u>2</u> :49		
Show partial update				
Proces	ss Stop	() 本の 法定安全 SMA キ キャロ思示者を示容 ① TOUCHID 展法会話 iPhono 上放所 Touch ID・		
			I	Midth = 1080
				Height = 1920
				Exit

并提供与主报告区之数据作连动功能,方便找寻影像数据位置。 Save Image 可将还原影像以.jpg/.bmp/.bin 方式输出。

DSI 若以 Video mode 传送影像数据,也有提供 Porch 功能可统计每张影像所送出的格式,

可统计 VSA, VBP, VFP, HBP, HFP, image 的功能



附录三:无法量测/仅量测到 LP mode 信号/大量错误产生解决方法:

Step 1: 请检查探头与主机间的 2 条 USB 是否有没接好或接触不良问题

• 将主机端与 WayStation 端的 USB 拔除再重新插回

Step 2: 请检察 Lane/CLK 的焊线是否有在规定内之 5mm 内, 并确认每个 End-tip 都有 接上 Gnd,

Step 3: 开启波形检视功能并送出 HS 信号, 用以确定接线正常,

Step 3.1: 开启波形检视功能

10BaseT1S BiSS CAN DALI DP-AUX eDP eMMC 5.1 eSPI HID_12C 12C 12S LIN MIPI 2C IZS LIN MIPI CSI MIPI CSI MIPI 13C MIPI 13C MIPI 13C MIPI SPMI Modbus NAND Flash PMBus Profibus PVM	Lane Number Probe Connection		4 Lanes	触发条件		
	Acute MIPI D-PHY Way Station	GND D0+ D0- D1+ D1- CLK+	Physical Connection D0 D1 V	ECC Error (Single-bi ECC Error (Multi-bit CRC error External Trigger In	it Error) Error)	
	Acute MIPI D-PHY Way Station (Bottom)	GND D2+ D2- D3+ D3- NC NC	D2	Filter Data > Timing Setup Clock Rate T CLK-SETTLE Phase D0	48 bytes Auto Auto	÷
0 4.0 GMII MBus PI VID ART FS SB 1.1 SB 1.1	Tearing Effect Signal		1.8V (From Channel A0)	D1 D2 D3 CLK	0 0 0 0	
SB PD	✓ Enable Waveform capture Note: The timing informat	for connection betwee	tion verification (Beta) In lanes is not correct!	Phase A	Adjustment	

Step 3.2: 切换模式,使用 Protocol Monitor mode 并缩小内存, 若后续解决问题,再切换回 Protocol Analyzer mode



File	Capture Cursor	Search All Field					
Conne	ect Protocol Configuration Waveform, Run	Search N V To bottom Window, Save t					
Tim	estamp (h:m:s.ms.Mode VC Data Ty	pe DCS (h) WC Data (h)					
1	Configuration Settings	×					
	Operation mode						
	• Protocol analyzer						
		✓ Device memory limitation					
		1%					
	• Protocol logger	⊖ Wait for Stop					
		Wait for Trigger					
4	DATA	Trigger Position < 50%					
Wavefo		When Triggered					
Time/Div		Fill device memory then stop -3					
	Protocol monitor	 Stop immediately 33 					
		○ Wait for 1 🚖 seconds then stop					
	DATA						
		○ Default					
L							

Step 3.3: 开启波形窗口

File	Capture	Cursor					-		
Conne	ect Protoc	ol Protoco	I Monitor	Show	* Waveforms	Run	Q Searc	hAll Field	
Tim 1	estamp (h:m:s.ms	Mode	Hid ✓ Sho	e Waveform w Waveforn I	s ns	DCS (h	.)	WC Da
Vavefo	rm								
ime/Div	= 10 ns,	.	-3	6.53 us	-36.52 us	-36.51 u	s -36.5	us -36.	49 us - 36.4
			4F	3B	3F	57	38	3B	5F
⊿ D0	Tb-:	Dp-85 Dn-86							
N		80		3.4 n	6.7 ns	8.3 n	3.3 n	8.3 n	5.6 ns

Step 3.4: 撷取波形

Step 3.5: 分析是否有 HS 信号, 红色箭头"前"波形为 LP, "后"则为 HS 信号, 请找到相似 位置并将其波形放大检视, 若重复撷取数次仍无法找到 LP, HS 波形或有少 Lane/CLK 的情况, 可能原因为 Lane/CLK 没接通, 请见 FAQ 第七点,





Step 3.6: 确认 CLK Duty 是否为 50:50, 并检查 HS SYNC 1D 后方之 Lane 0-3 的每一个 edge 宽度,正常为半个 CLK cycle 的宽度或其倍数,如非正常,请再次检查 焊线是否符合规定, 若符合规定,仍会有噪声或是 CLK Duty 问题,请继续缩短焊线长度,Gnd 也就 近引入,

Ex: CLK duty 不好情况, 65:35, 1.4ns:0.8ns





Ex: Lane 0, Lane 3 不为半个 CLK cycle 的宽度 Half CLK cycle = (1.4 + 0.8) / 2 = 1.1 (ns) 正常的 Data 波形约 1.1ns 或其倍数





附录四:还原影像列表

1. Video mode - 1125 * 2436





2. CMD mode - 1125 * 2436

