



BF7264B/B+/Pro
SD 3.0 / SDIO 3.0
方案说明

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概况

支援型号:

BF6264B	BF7264B	BF7264B+	BF7264 Pro
•	•	•	•

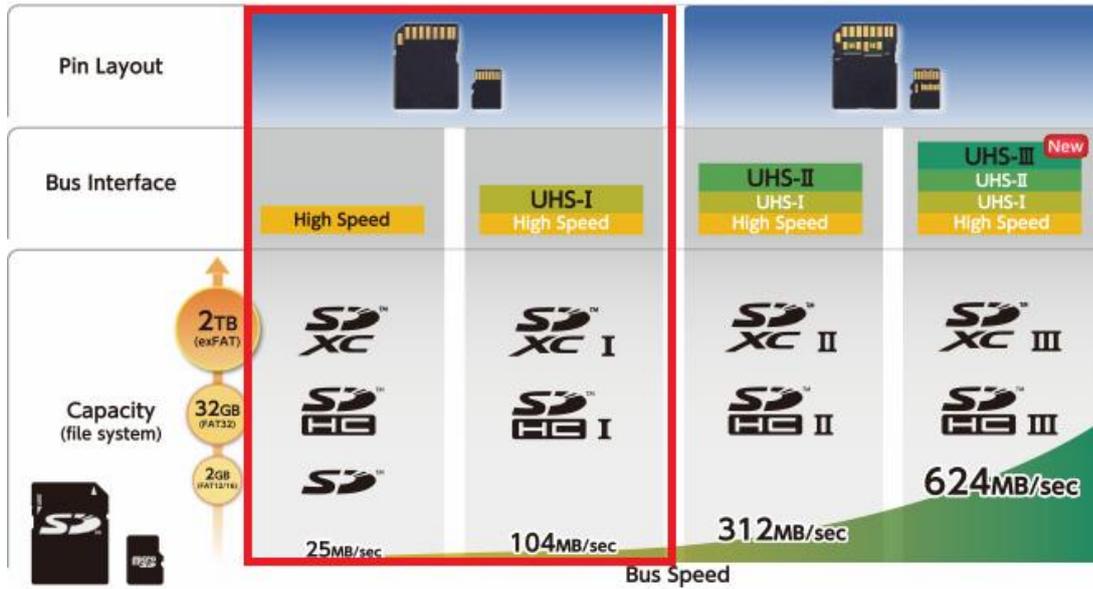
BF7264B/B+/Pro 产品正面有两个 USB 孔

SD 3.0 方案，规格内容如下：

1. BF7264B/B+/Pro，32Gb RAM，搭配 SD 4.0 / SD 3.0 探头组



2. 支援 SD 3.0 SDR104 / SD6.0 Legacy mode SDR104, DDR200/ SDIO 3.0



3. 可显示 SD 3.0 协议封包数据以表格方式呈现，包含指令解析

Timestamp (h:m:s.ms.us.ns dur)	Event	Data	Information	Error mesag Bus	Clock	CMD DuraticData Durati
17:35:59.687.190.429 606.5..	ACMD06 SET_BUS_WIDTH	46 00 00 00 02 CB			232.451 K	Nrc: 94 202.196us
17:35:59.687.444.247 253.8..	Resp6 R1	06 00 00 09 20 B9				Nrc: 11 202.196us
17:35:59.688.052.980 608.7..	CMD16 SET_BLOCKLEN	50 00 00 02 00 15			232.446 K	Nrc: 94 202.196us
17:35:59.688.306.798 253.8..	Resp16 R1	10 00 00 09 00 0B				Nrc: 11 202.196us
17:35:59.688.954.350 647.5..	CMD55 APP_CMD	77 AA AA 00 00 2B			14.8622 M	Nrc: 6618 3.15968us
17:35:59.688.958.316 3.96us	Resp55 R1	37 00 00 09 20 33				Nrc: 11 3.15968us
17:35:59.689.247.424 289.1..	ACMD51 SEND_SCR	73 00 00 00 00 C7			14.8622 M	Nrc: 4249 3.15968us
17:35:59.689.251.390 3.96us	Resp51 R1	33 00 00 09 20 91				Nrc: 12 3.15968us
17:35:59.689.398.795 147.4..	Read, 16 bytes	02 35 84 03 00 00 00 00...	SC=1 WaitTime:144.246us		4bit	Nac: 2147 2.22311us
17:35:59.690.344.700 945.9..	CMD06 SWITCH_FUNC	46 00 FF FF FF E3			14.8622 M	Nrc: 16 3.15968us
17:35:59.690.348.937 4.23us	Resp6 R1	06 00 00 09 00 DD				Nrc: 16 3.15968us
17:35:59.691.364.272 1.01ms	Read, 64 bytes	00 64 80 01 80 01 80 0F...	SC=1 WaitTime:1.01218ms		4bit	Nac: 15066 9.74902us
17:35:59.692.145.894 781.6..	CMD06 SWITCH_FUNC	46 00 FF FF F3 3B			14.8852 M	Nrc: 15 3.15968us
17:35:59.692.150.127 4.23us	Resp6 R1	06 00 00 09 00 DD				Nrc: 15 3.15968us
17:35:59.692.198.052 47.92..	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:44.7655us		4bit	Nac: 666 9.74902us
17:35:59.692.896.862 698.8..	CMD06 SWITCH_FUNC	46 80 FF FF F3 0D			14.8852 M	Nrc: 15 3.15635us
17:35:59.692.901.095 4.23ms	Resp6 R1	06 00 00 09 00 DD				Nrc: 15 3.15968us
17:35:59.694.732.735 1.83ms	Read, 64 bytes	00 C8 80 01 80 01 80 0F...	SC=1 WaitTime:1.82848ms		4bit	Nac: 27175 9.74902us
17:35:59.695.628.089 895.3..	CMD06 SWITCH_FUNC	46 00 FF 3F FF 9F			14.8852 M	Nrc: 33 3.15968us
17:35:59.695.633.468 5.37us	Resp6 R1	06 00 00 09 00 DD				Nrc: 33 3.15968us
17:35:59.695.917.396 283.9..	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:280.769us		4bit	Nac: 4179 9.74902us
17:35:59.696.604.911 687.5..	CMD06 SWITCH_FUNC	46 80 FF 3F FF A9			14.8622 M	Nrc: 33 3.15968us
17:35:59.696.610.291 5.37us	Resp6 R1	06 00 00 09 00 DD				Nrc: 33 3.15968us
17:35:59.696.917.340 307.0..	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:303.89us		4bit	Nac: 4523 9.75236us
17:35:59.701.159.849 4.24ms	CMD13 SEND STATUS	4D AA AA 00 00 43			204.276 M	Nrc: 33 229.977ms
17:35:59.701.160.339 389.9..	Resp13 R1	0D 00 00 09 00 3F				Nrc: 33 226.644ms
17:35:59.701.831.008 670.6..	CMD13 SEND STATUS	4D AA AA 00 00 43			204.276 M	Nrc: Over. 229.977ms
17:35:59.701.831.399 389.9..	Resp13 R1	0D 00 00 09 00 3F				Nrc: 32 229.977ms
17:35:59.702.396.852 565.4..	CMD13 SEND STATUS	4D AA AA 00 00 43			204.276 M	Nrc: Over. 229.977ms
17:35:59.702.397.245 393.2..	Resp13 R1	0D 00 00 09 00 3F				Nrc: 33 229.977ms
17:35:59.702.863.369 566.1..	CMD13 SEND STATUS	4D AA AA 00 00 43			204.276 M	Nrc: Over. 226.644ms
17:35:59.702.863.759 389.9..	Resp13 R1	0D 00 00 09 00 3F				Nrc: 33 229.977ms
17:35:59.703.530.462 566.7..	CMD13 SEND STATUS	4D AA AA 00 00 43			204.276 M	Nrc: Over. 229.977ms
17:35:59.703.530.852 389.9..	Resp13 R1	0D 00 00 09 00 3F				Nrc: 32 229.977ms
17:35:59.704.098.232 567.3..	CMD13 SEND STATUS	4D AA AA 00 00 43			204.276 M	Nrc: Over. 229.977ms
17:35:59.704.098.622 389.9..	Resp13 R1	0D 00 00 09 00 3F				Nrc: 32 229.977ms
17:35:59.704.666.581 567.9..	CMD13 SEND STATUS	4D AA AA 00 00 43			204.276 M	Nrc: Over. 229.977ms
17:35:59.704.666.975 393.2..	Resp13 R1	0D 00 00 09 00 3F				Nrc: 33 229.977ms
17:35:59.705.235.615 568.6..	CMD13 SEND STATUS	4D AA AA 00 00 43			204.276 M	Nrc: Over. 229.977ms
17:35:59.705.236.008 393.2..	Resp13 R1	0D 00 00 09 00 3F				Nrc: 33 229.977ms

```

Detail
CMD06 SWITCH_FUNC
[31] Mode= Check function (0)
[3:0] group 1 Access mode= SDR104 (3h)

[CRCT] = 1Dh (8b:3Bh)
[Raw Data]
0 1 2 3 4 5 6 7 ASCII
0h 46 00 FF FF F3 3B F....
  
```

4. 使用 32Gb RAM 搭配硬盘串流来储存 SD 3.0 通讯数据，可完整节录待测物从低速初始化到高速传输数据的流程
5. 提供 Data Filter 功能，可将不必要的的数据滤除以节省内存
6. 提供 Search 数据功能
7. 提供 CRC Packet 计算及错误显示
8. SD 3.0 命令统计功能，包含封包总数、各类别指令数量以及错误数量统计

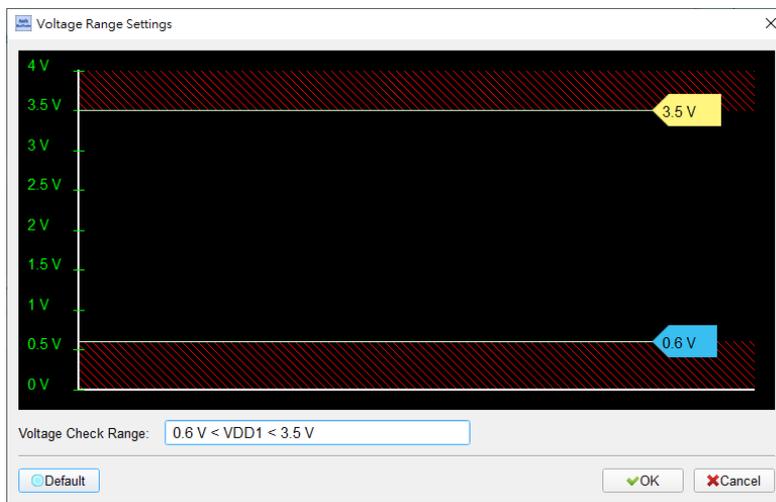
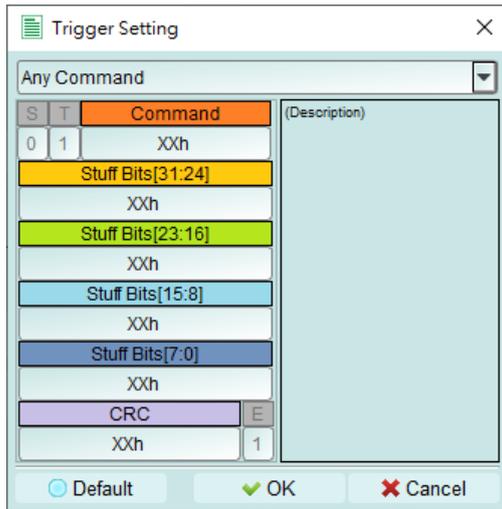
Navigator			Statistics		
Discription	Txns	Bytes	Txns	Bytes	
CMD	489		CMD00	8	
ACMD	84		CMD08	8	
DATA	16533	8397134	CMD55	84	
Write SC of CMD24	0	0	CMD11	3	
Write SC of CMD25	2	8212	CMD02	5	
Read SC of CMD17	5	2560	CMD03	5	
Read SC of CMD18	58	8391632	CMD09	5	
ERROR	28		CMD07	5	
			CMD13	119	
			CMD16	5	
			CMD06	17	
			CMD17	5	
			CMD18	58	
			CMD12	60	
			CMD36	1	
			CMD45	2	
			CMD39	1	
			CMD19	96	
			CMD25	2	

9. SD 3.0 命令触发功能

- 触发参数包含命令与参数资料可依据不同种类封包填入数值,
- 涵盖所有 Command 或 16 byte Data,
- 可触发 CRC7, CRC16, End Bit Error,
- 可触发 3 种 timeout, CRC Status pattern,
- 可触发 VCC drop, VCCQ2 drop
- 可透过 Trigger-Out 接孔同步触发外部的示波器

触发条件

<input type="checkbox"/> CMD / Resp. / Data	<input type="checkbox"/> End bit error
<input checked="" type="radio"/> CMD/RESP. <input type="radio"/> Data <input type="text" value="..."/>	<input type="checkbox"/> CRC7 error
	<input type="checkbox"/> CRC16 error
<input type="checkbox"/> VDD Drop	<input type="checkbox"/> CRC status <input type="text" value="Positive"/>
<input type="text" value="..."/>	<input type="checkbox"/> CRC status timeout
	<input type="text" value="1"/> <input type="text" value="ns"/>



10. 报告区进阶使用方法

统计列表: 以统计功能快速分类并可追踪数据位置

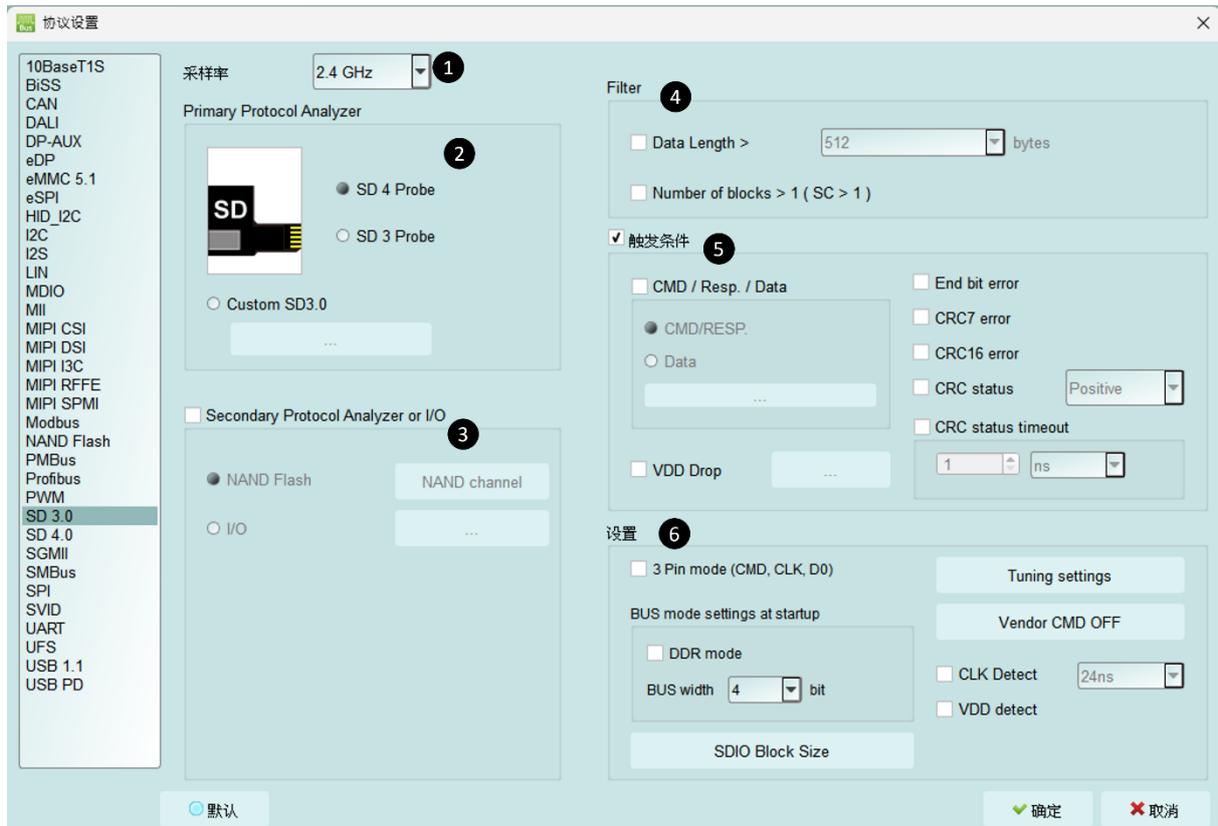
Timestamp (h:m:s.ms.us.ns.ndr)	Event	Data	Information	Error message	Bus	Clock	CMD Duration	Data Duration
17:35:59.687.190.429.606.5	ACMD06 SET_BUS_WIDTH	46 00 00 00 02 CB		232.451 K	Ncr: 94	202.196us		
17:35:59.687.444.247.253.8	Resp6 R1	06 00 00 09 20 B9			Ncr: 11	202.196us		
17:35:59.688.052.960.608.7	CMD16 SET_BLOCKLEN	50 00 00 02 00 15		232.446 K	Ncr: 94	202.196us		
17:35:59.688.306.798.253.8	Resp16 R1	10 00 00 09 00 0B			Ncr: 11	202.196us		
17:35:59.688.954.350.647.5	CMD55 APP_CMD	77 AA AA 00 00 2B		14.8622 M	Ncr: 6618	3.15968us		
17:35:59.688.958.316.3.96us	Resp55 R1	37 00 00 09 20 33			Ncr: 11	3.15968us		
17:35:59.689.247.424.289.1	ACMD51 SEND_SCR	73 00 00 00 00 C7		14.8622 M	Ncr: 4249	3.15968us		
17:35:59.689.251.390.3.96us	Resp51 R1	33 00 00 09 20 91			Ncr: 12	3.15968us		
17:35:59.689.398.795.147.4	Read, 16 bytes	02 35 84 03 00 00 00 00...	SC=1 WaitTime:144.246us	4bit	Nac: 2147		2.22311us	
17:35:59.690.344.700.945.9	CMD06 SWITCH_FUNC	46 00 FF FF F3 3B		14.8622 M	Ncr: 15	3.15968us		
17:35:59.690.348.837.4.23us	Resp6 R1	06 00 00 09 00 DD			Ncr: 16	3.15968us		
17:35:59.690.394.822.1.02us	Read, 64 bytes	00 64 80 01 80 01 80 0F...	SC=1 WaitTime:1.83748ms	4bit	Nac: 19066		9.74902us	
17:35:59.692.145.894.781.6	CMD06 SWITCH_FUNC	46 00 FF FF F3 3B		14.8852 M	Ncr: 15	3.15968us		
17:35:59.692.150.127.4.23us	Resp6 R1	06 00 00 09 00 DD			Ncr: 15	3.15968us		
17:35:59.692.198.052.47.92...	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:44.7655us	4bit	Nac: 666		9.74902us	
17:35:59.692.896.862.698.8	CMD06 SWITCH_FUNC	46 80 FF FF F3 0D		14.8852 M	Ncr: 15	3.15635us		
17:35:59.692.901.095.4.23us	Resp6 R1	06 00 00 09 00 DD			Ncr: 15	3.15968us		
17:35:59.694.732.735.1.83ms	Read, 64 bytes	00 C8 80 01 80 01 80 0F...	SC=1 WaitTime:1.82948ms	4bit	Nac: 27175		9.74902us	
17:35:59.695.628.089.895.3	CMD06 SWITCH_FUNC	46 00 FF 3F FF 9F		14.8852 M	Ncr: 33	3.15968us		
17:35:59.695.633.468.5.37us	Resp6 R1	06 00 00 09 00 DD			Ncr: 33	3.15968us		
17:35:59.695.917.396.283.9...	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:280.769us	4bit	Nac: 4179		9.74902us	
17:35:59.696.604.911.697.5	CMD06 SWITCH_FUNC	46 80 FF 3F FF A9		14.8622 M	Ncr: 15	3.15968us		
17:35:59.696.610.291.5.37us	Resp6 R1	06 00 00 09 00 DD			Ncr: 33	3.15968us		
17:35:59.696.917.340.307.0...	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:303.89us	4bit	Nac: 4523		9.75236us	
17:35:59.701.159.949.4.24ms	CMD13 SEND_STATUS	4D AA AA 00 00 43		204.276 M	Ncr: Over	229.977ns		
17:35:59.701.160.339.389.9...	Resp13 R1	0D 00 00 09 00 3F			Ncr: 33	226.644ns		
17:35:59.701.831.008.670.6...	CMD13 SEND_STATUS	4D AA AA 00 00 43		204.276 M	Ncr: Over	229.977ns		
17:35:59.701.831.398.389.9...	Resp13 R1	0D 00 00 09 00 3F			Ncr: 32	229.977ns		

Discription	Trns	Bytes
CMD	489	
ACMD	84	
DATA	16533	8397134
Write SC of CMD24	0	0
Write SC of CMD25	2	8212
Read SC of CMD17	5	2560
Read SC of CMD18	58	8391632
ERROR	28	

Statistics	Trns	Bytes
CMD08	8	
CMD55	84	
CMD11	3	
CMD03	5	
CMD09	5	
CMD07	5	
CMD13	119	
CMD16	5	
CMD06	17	
CMD17	5	
CMD18	58	
CMD12	60	
CMD36	1	
CMD45	2	
CMD18	1	

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11. SD 3.0 settings



1. **Sample Rate:** 选择使用的采样率，若要开启 Secondary Protocol Analyzer – NAND Flash 选项，采样率须设置为 1GHz 以下，
2. **Primary Protocol Analyzer:** 可选择使用探头类型，也可自定义通道/触发准位，
3. **Secondary Protocol Analyzer or I/O:** 可额外开启一组指定之逻辑分析，以剩下可用脚位同时进行分析，
4. **Filter:** 每一笔 Data Frame 可指定收录之大小，大于设置值的数据则不会被记录下来
5. **Trigger on:** 可设置 CMD, DATA, ERROR, Voltage, Timeout, CRC Status 触发条件
6. **Option:**
 - a. **3 Pin mode:** 接上 CLK, CMD, D0 后，可进行命令流程以及状态的协议分析，主要用于接线困难或是非数据错误的待测物使用，
 - b. **Startup:** 需设置于撷取当下，待测物所运行之模式，
 - c. **Tuning setting:** 提供相位调整功能
 - d. **Vendor CMD:** 可自行更改命令组名称，是否带有数据，
 - e. **CLK Detect:** 可侦测 CLK 是否有动作，
 - f. **两组电压侦测功能**

FAQ

1. 支持 SD 第几版的规格?

A：支援到 SD3.0 SDR104, SD6.0 Legacy mode SDR104 / DDR200。

2. 量测时是否会影响讯号质量?

A：外接的仪器量测必然会有部分的负载效应影响，我们采用主动探头的连接方式来降低对待测物干扰并提升讯号质量。

3. 是否有支持讯号发送 (Tx) 功能?

A：不支持讯号发送功能

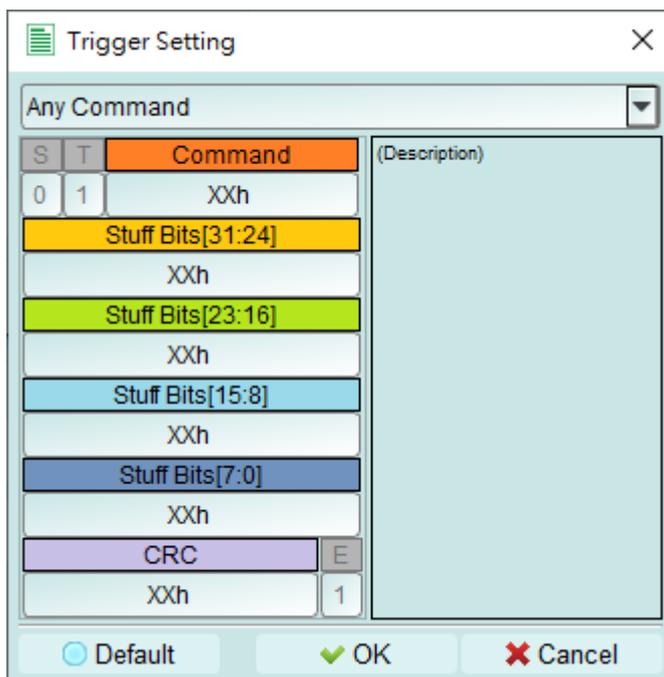
4. 量测时须注意的事项

a. 接线问题判断与排除方法:

请确实按手册**探头与待测物连接方式**进行连接。

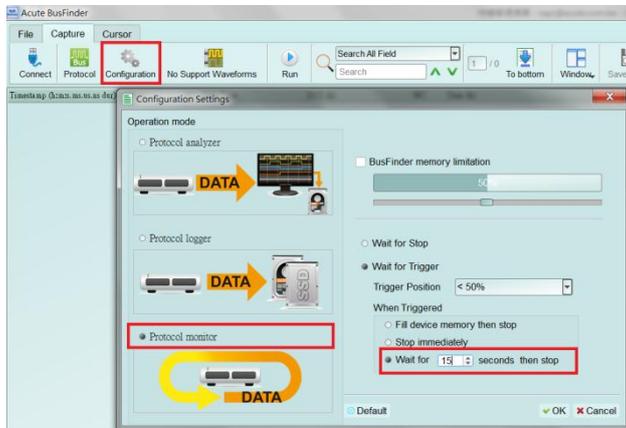
5. 有指定某个 SD 3.0 做为 trigger 点的功能吗?

A：可以指定特定的 SD 3.0 packet 或是 Error 进行触发。



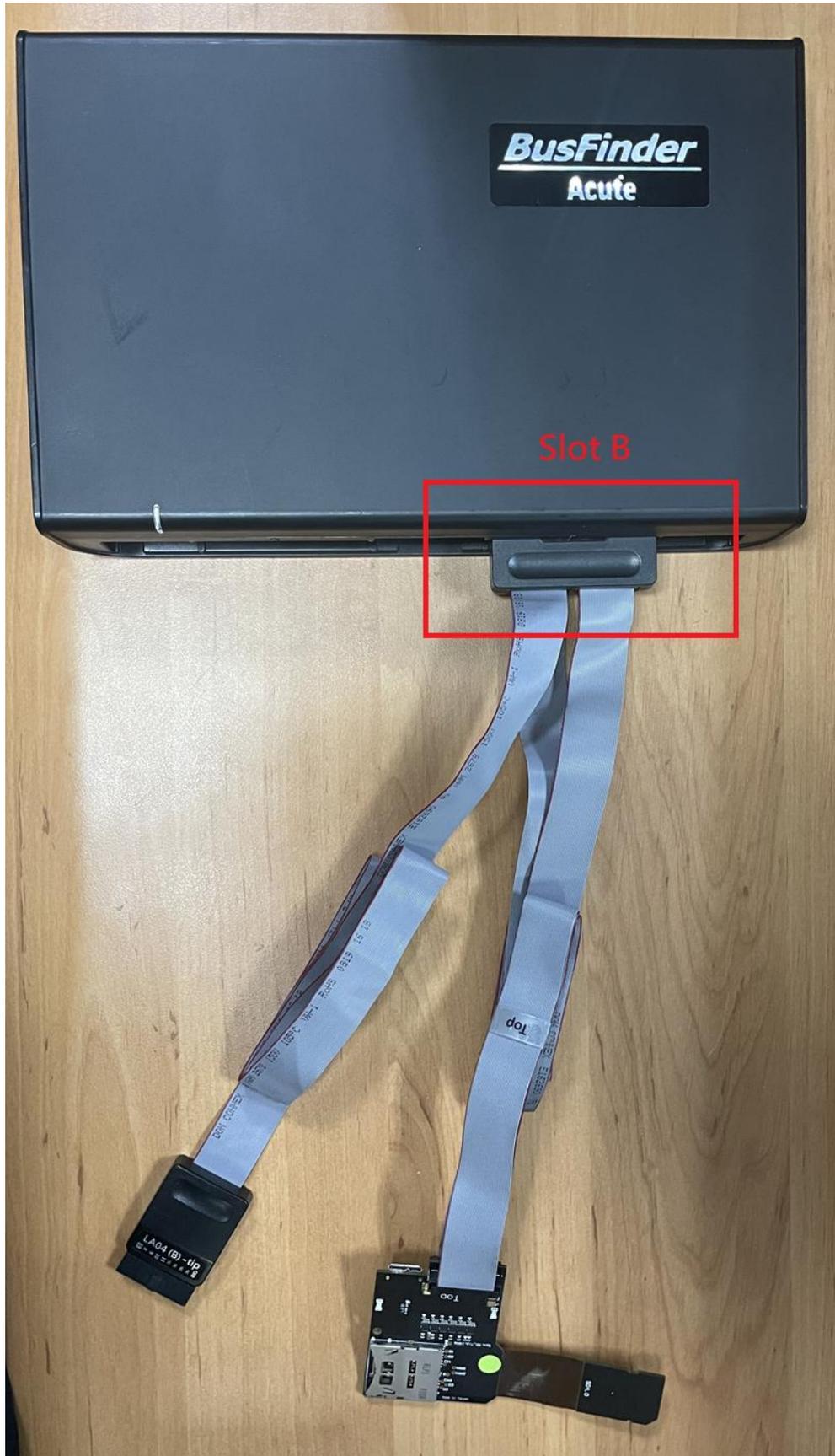
6. 是否可以自行设置一个 SD 3.0 起始点，指定抓取多少时间内的 Data?

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数据监控仪模式，并指定撷取时间长度。

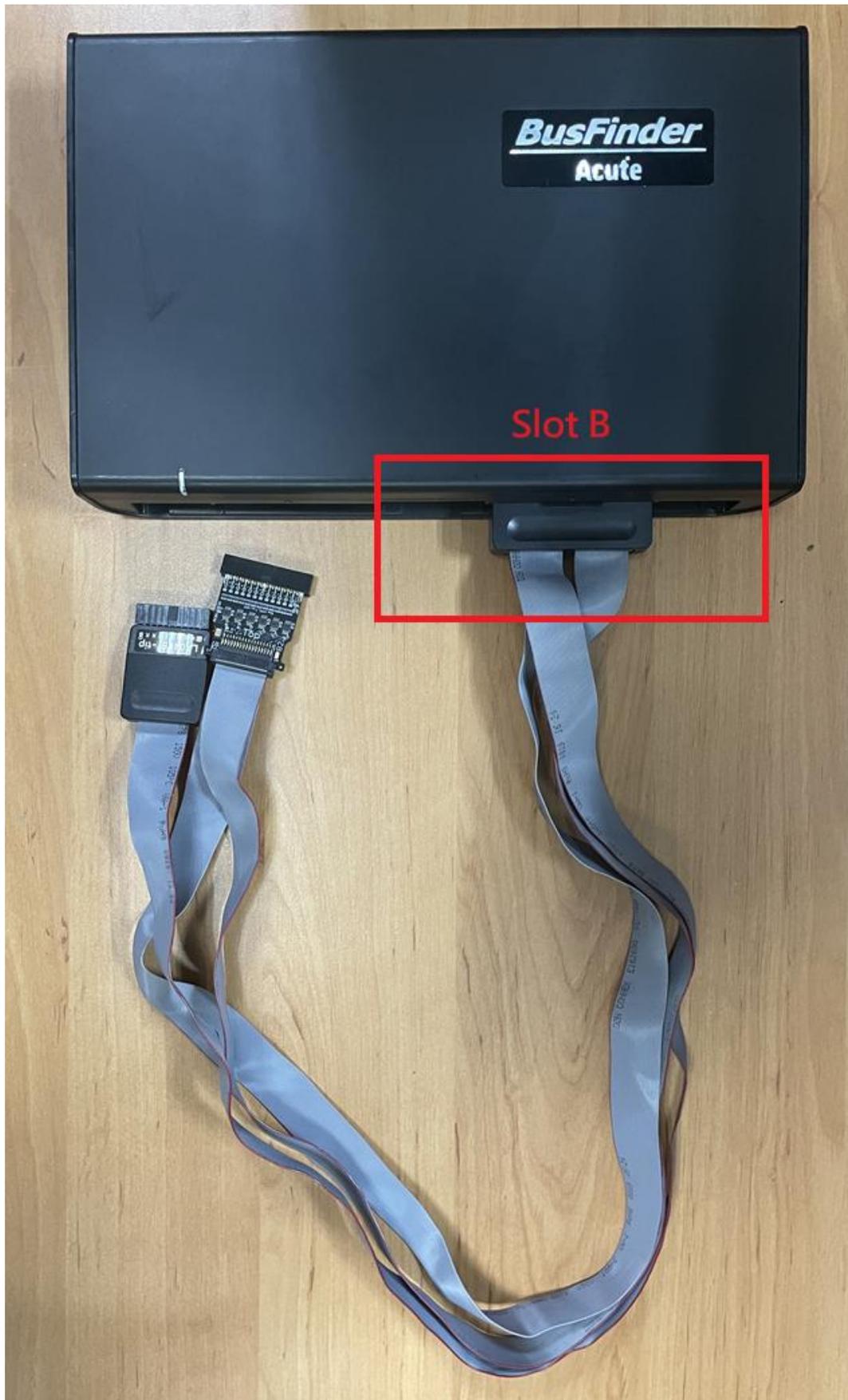


主机与探头连接方式

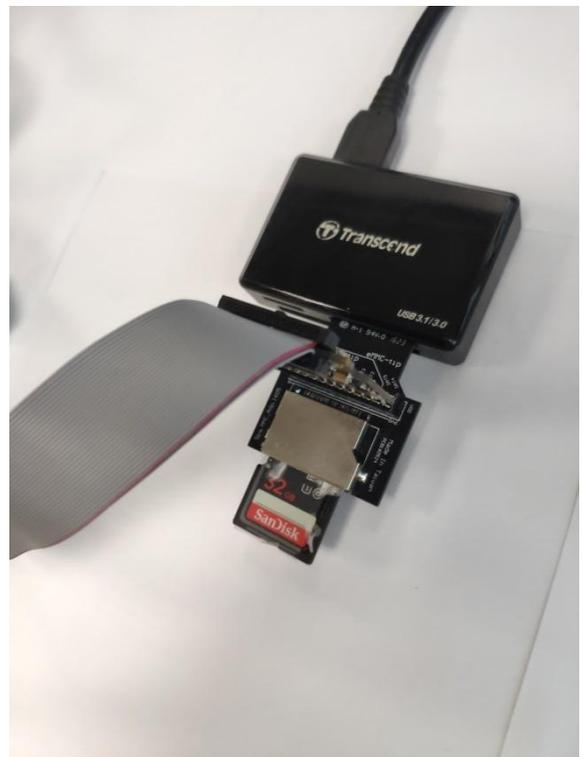
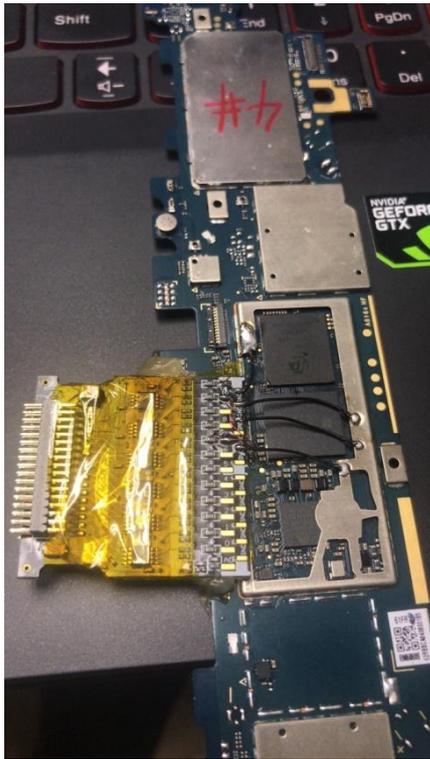
主机仅能使用 Slot B 作为探头连接槽。



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探头与待测物连接方式



SD4.0 转板测试点:

使用时机:

- 需同时使用示波器查看波形时
- 可检查转板之软板电路是否正常时, 可以电表测量前端金手指与测点是否导通

