



BF7264 系列
SD 3.0 / SD 4.0 / 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

BF7264B/B+/Pro，32Gb RAM

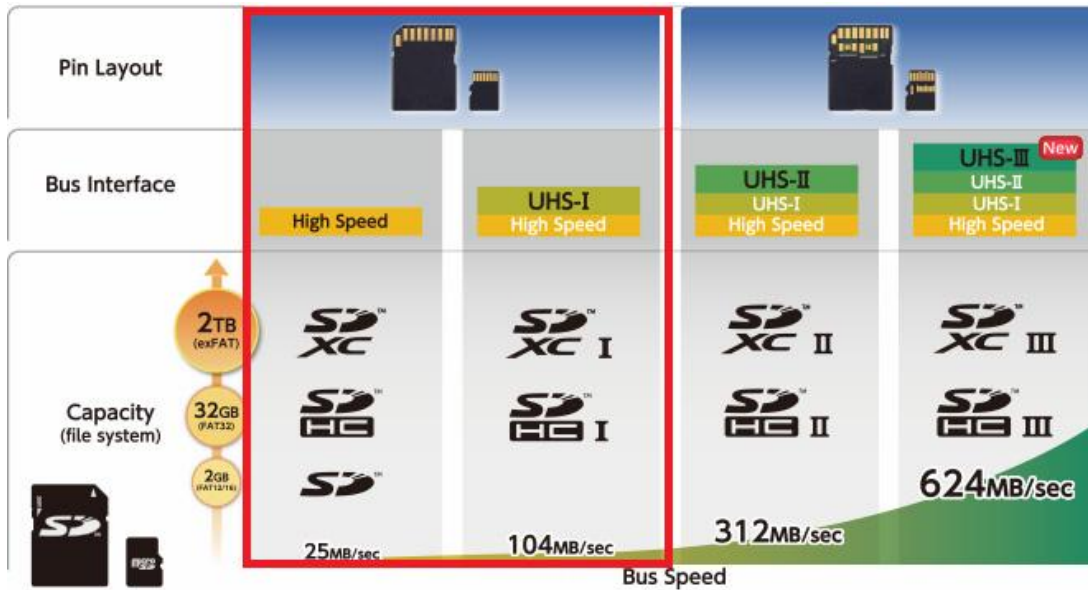
1. 搭配 SD 3.0 探头组，可以量测 SD 3.0 信号



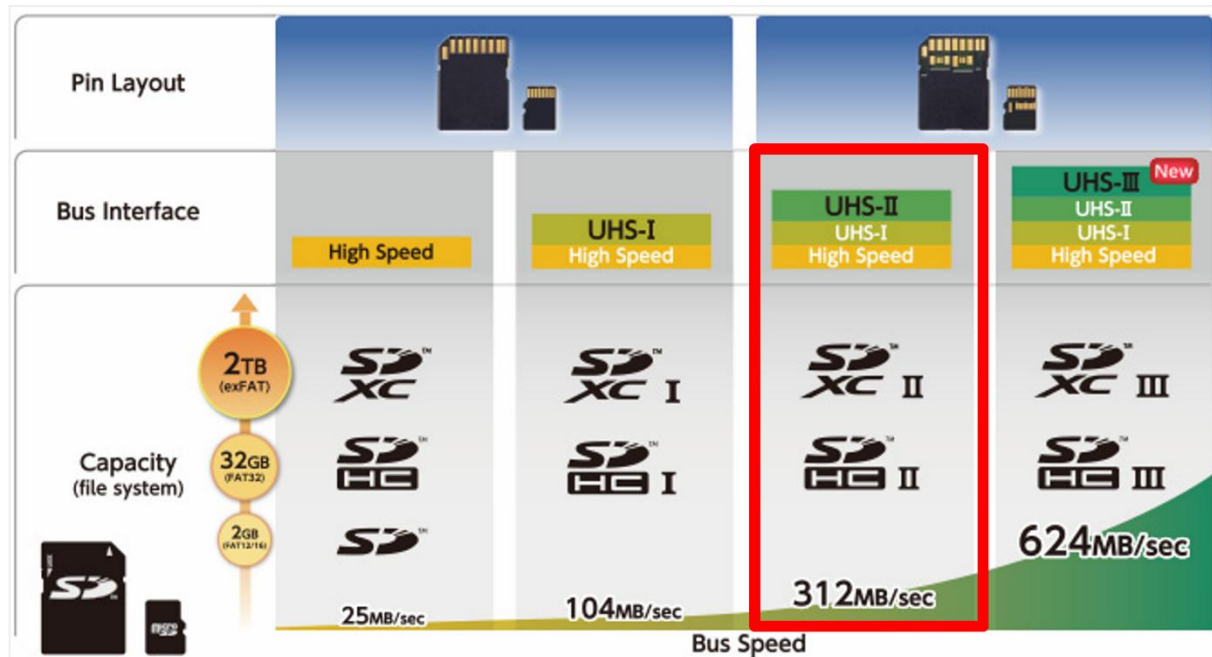
2. 搭配 SD 4.0 探头组，可以量测 SD 4.0 信号



SD3.0 方案支持 SD 3.0 SDR104 / SD6.0 Legacy mode SDR104, DDR200/ SDIO 3.0 信号量测



SD4.0 方案支持 SD4.0 信号量测



I. 可显示 SD 3.0 / SD 4.0 协议封包数据以表格方式呈现，包含指令解析

SD 3.0

Timestamp (h:m:s.ms.us.ns dur)	Event	Data	Information	Error message	Bus	Clock	Cmd DuraticData Durati	Detail
17:35:59.497.190.429 406.5.	ACMD04 SET_BUS_WIDTH	46 00 00 00 02 CB			232.451 K	Hocr: 94	202.196us	Detail
17:35:59.497.444.247 253.8.	Resp2 R1	04 00 00 09 20 29				Hocr: 11	202.196us	
17:35:59.498.052.950 609.7.	CMD16 SET_BLOCKLEN	50 00 00 02 00 15			232.446 K	Hocr: 94	202.196us	[31] Mode= Check function (0) [3:0] group 1 Access mode= SDR104 (3h)
17:35:59.498.306.798 253.8.	Resp16 R1	10 00 00 09 00 0B				Hocr: 11	202.196us	
17:35:59.498.954.350 447.5.	CMD55 APP_CMD	77 AA AA 00 00 2B			14.8622 M	Hocr: 6618	3.15968us	[Raw Data] 0 1 2 3 4 5 6 7 ASCII 0h 46 00 FF FF F3 10 F....
17:35:59.498.958.316 3.96us	Resp55 R1	37 00 00 09 20 34				Hocr: 11	3.15968us	
17:35:59.499.247.424 259.1.	ACMD51 SEND_SCR	73 00 00 00 00 C7			14.8622 M	Hocr: 4249	3.15968us	
17:35:59.499.251.390 3.96us	Resp51 R1	33 00 00 09 20 91				Hocr: 12	3.15968us	
17:35:59.499.390.795 147.4.	Read, 16 bytes	02 35 84 03 00 00 00 00...	SC=1 WaitTime:144.246us		48bit	Hocr: 2147	2.02311us	
17:35:59.499.344.700 945.9.	CMD06 SWITCH_FUNC	46 00 FF FF E3			14.8622 M	Hocr: 33	3.15968us	
17:35:59.499.345.937 4.23us	Resp6 R1	06 00 00 09 00 D0				Hocr: 16	3.15968us	
17:35:59.499.364.272 1.01us	Read, 64 bytes	00 44 80 01 80 01 80 0F...	SC=1 WaitTime:1.01218ms		48bit	Hocr: 1544	9.74902us	
17:35:59.499.145.894 781.6.	CMD06 SWITCH_FUNC	46 00 FF FF F3 3B			14.8652 M	Hocr: 33	3.15968us	
17:35:59.499.150.127 4.23us	Resp6 R1	06 00 00 09 00 D0				Hocr: 15	3.15968us	
17:35:59.499.195.052 47.92.	Read, 64 bytes	00 FA 90 01 80 01 80 0F...	SC=1 WaitTime:44.7655us		48bit	Hocr: 666	9.74902us	
17:35:59.499.194.042 495.8.	CMD06 SWITCH_FUNC	46 00 FF FF F3 0D			14.8652 M	Hocr: 33	3.15968us	
17:35:59.499.192.055 4.23us	Resp6 R1	06 00 00 09 00 D0				Hocr: 15	3.15968us	
17:35:59.499.732.735 1.83ms	Read, 64 bytes	00 C8 80 01 80 01 80 0F...	SC=1 WaitTime:1.82848ms		48bit	Hocr: 27175	9.74902us	
17:35:59.499.628.089 895.3.	CMD06 SWITCH_FUNC	46 00 FF 3F 9F 9F			14.8652 M	Hocr: 33	3.15968us	
17:35:59.499.633.468 5.37us	Resp6 R1	06 00 00 09 00 D0				Hocr: 33	3.15968us	
17:35:59.499.917.394 283.9.	Read, 64 bytes	00 FA 90 01 80 01 80 0F...	SC=1 WaitTime:120.769us		48bit	Hocr: 4179	9.74902us	
17:35:59.499.604.911 487.5.	CMD06 SWITCH_FUNC	46 00 FF 3F FF A5			14.8622 M	Hocr: 33	3.15968us	
17:35:59.499.610.291 5.37us	Resp6 R1	06 00 00 09 00 D0				Hocr: 4523	9.74902us	
17:35:59.499.917.340 307.0.	Read, 64 bytes	00 FA 90 01 80 01 80 0F...	SC=1 WaitTime:1303.89us		48bit	Hocr: 4523	9.74902us	
17:35:59.701.159.949 4.24ms	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M	Hocr: 33	229.977ns	
17:35:59.701.160.389 389.9.	Resp13 R1	0D 00 00 09 00 3F				Hocr: 33	226.444ns	
17:35:59.701.631.009 470.6.	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M	Hocr: Over	229.977ns	
17:35:59.701.631.399 389.9.	Resp13 R1	0D 00 00 09 00 3F				Hocr: 33	229.977ns	
17:35:59.702.396.052 565.4.	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M	Hocr: Over	229.977ns	
17:35:59.702.397.245 393.2.	Resp13 R1	0D 00 00 09 00 3F				Hocr: 33	229.977ns	
17:35:59.702.943.348 566.1.	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M	Hocr: Over	226.444ns	
17:35:59.702.943.758 389.9.	Resp13 R1	0D 00 00 09 00 3F				Hocr: 33	229.977ns	
17:35:59.703.630.462 566.7.	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M	Hocr: Over	229.977ns	
17:35:59.703.630.852 389.9.	Resp13 R1	0D 00 00 09 00 3F				Hocr: 32	229.977ns	
17:35:59.704.090.232 567.3.	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M	Hocr: Over	229.977ns	
17:35:59.704.090.622 389.9.	Resp13 R1	0D 00 00 09 00 3F				Hocr: 32	229.977ns	
17:35:59.704.666.581 567.9.	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M	Hocr: Over	229.977ns	
17:35:59.704.666.975 393.2.	Resp13 R1	0D 00 00 09 00 3F				Hocr: 33	229.977ns	
17:35:59.705.235.615 568.6.	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M	Hocr: Over	229.977ns	
17:35:59.705.236.008 393.2.	Resp13 R1	0D 00 00 09 00 3F				Hocr: 33	229.977ns	

SD 4.0

Timestamp (h:m:s.ms.us.ns dur)	Host(D0)	Card(D1)	Dir:Event	Data	Information	Bus	Detail
15:05:39.493.956.272 0 (De)	----	----	SD			A	Detail
15:05:39.494.146.720 190.4.	STB.L	----	SD			A	
15:05:39.494.146.720 000.0.	STB.L	STB.L	SD			A	
15:05:39.494.664.832 519.1.	----	STB.L	SD			A	
15:05:39.497.171.597 004.0.	----	----	SD			A	
15:05:39.498.224.929 001.0.	SYN	----	SD			A	
15:05:39.498.225.749 819.0.	SYN	----	SD			A	
15:05:39.498.226.825 001.0.	LIDL	SYN	SD			A	
15:05:39.498.226.849 021.0.	LIDL	LIDL	SD			A	
15:05:39.508.329.632 010.1.	CMMD(N)	LIDL	SD	Write 4B IOADR=202	80 00 92 02 0A A0 00 00...	DEVICE_INIT	
15:05:39.508.329.811 179.0.	LIDL	LIDL	SD			A	
15:05:39.522.739.137 014.4.	CMMD(N)	LIDL	SD	Write 4B IOADR=202	80 00 92 02 09 A0 00 00...	DEVICE_INIT	
15:05:39.522.739.179 0.	LIDL	LIDL	SD			A	
15:05:39.524.656.672 001.9.	CMMD(N)	LIDL	SD	Write 4B IOADR=202	80 00 92 02 0A A0 00 00...	DEVICE_INIT	
15:05:39.524.656.852 179.0.	LIDL	LIDL	SD			A	
15:05:39.525.420.242 763.3.	CMMD(N)	LIDL	SD	Write 4B IOADR=202	80 00 92 02 0A A0 00 00...	DEVICE_INIT	
15:05:39.525.420.422 179.0.	LIDL	LIDL	SD			A	
15:05:39.525.482.459 061.0.	CMMD(N)	LIDL	SD	Write 4B IOADR=203	80 00 92 03 00 00 00 00...	ENUMERATE	
15:05:39.525.483.673 179.0.	LIDL	LIDL	SD			A	
15:05:39.525.482.929 001.2.	CMMD(N)	LIDL	SD	Write 4B IOADR=203	80 00 92 03 11 00 00 00...	ENUMERATE	
15:05:39.525.483.109 179.0.	LIDL	LIDL	SD			A	
15:05:39.525.593.785 110.6.	CMMD(N)	LIDL	SD	Read 8B IOADR=000	81 00 20 00 AD 6A	Generic Capabilities Register	
15:05:39.525.593.915 129.0.	LIDL	LIDL	SD			A	
15:05:39.525.595.198 001.2.	RES(N)	LIDL	SD		A0 10 20 00 00 01 01 00...		
15:05:39.525.595.428 229.0.	LIDL	LIDL	SD			A	
15:05:39.525.675.623 080.1.	CMMD(N)	LIDL	SD	Read 8B IOADR=002	81 00 20 02 5D 25	PHY Capabilities Register	
15:05:39.525.675.750 126.0.	LIDL	LIDL	SD			A	
15:05:39.525.677.033 001.2.	RES(N)	LIDL	SD		A0 10 20 02 00 00 00 00...		
15:05:39.525.677.263 229.0.	LIDL	LIDL	SD			A	
15:05:39.525.758.585 081.3.	CMMD(N)	LIDL	SD	Read 8B IOADR=004	81 00 20 04 ED EE	LINK/TRAN Capabilities Register	
15:05:39.525.758.715 129.0.	LIDL	LIDL	SD			A	
15:05:39.525.759.898 001.2.	RES(N)	LIDL	SD		A0 10 20 04 20 02 00 00...		
15:05:39.525.760.228 229.0.	LIDL	LIDL	SD			A	
15:05:39.526.748.309 989.0.	CMMD(N)	LIDL	SD	Write 4B IOADR=00B	81 00 90 0B 00 00 00 C0...	PHY Settings Register	
15:05:39.526.748.489 179.0.	LIDL	LIDL	SD			A	
15:05:39.526.749.773 001.2.	RES(N)	LIDL	SD		A0 10 10 0B 1B 0D		
15:05:39.526.749.899 126.0.	LIDL	LIDL	SD			A	

II. 使用 32Gb RAM 搭配硬盘串流来储存 SD 3.0 / SD 4.0 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

III. 提供 Data Filter 功能，可将不必要的数据滤除以节省内存

IV. 提供 Search 数据功能

V. 提供 CRC Packet 计算及错误显示

VI. SD 3.0 / SD 4.0 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

SD 3.0

Navigator			Statistics		
Description	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	

SD 4.0

Navigator		
Description	Txns	Bytes
UHSII Bus		
Command Count	34	
Read/Write Count	11	
Read Count	11	
Write Count	0	
Write SC of CMD24	0	0
Write SC of CMD25	0	0
Read SC of CMD17	0	0
Read SC of CMD18	0	0
ERROR	0	0
Others	0	0

Statistics	Txns	Bytes
Rd Data(TLen= 1)	5	
Rd Data(TLen= 2)	1	
Rd Data(TLen= 16)	4	
Rd Data(TLen= 8)	1	

VII. 命令触发功能

1. SD 3.0

- a. 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,
- b. 涵盖所有 Command 或 16 byte Data,
- c. 可触发 CRC7, CRC16, End Bit Error,
- d. 可触发 3 种 timeout, CRC Status pattern,
- e. 可触发 VCC drop, VCCQ2 drop
- f. 可透过 Trigger-Out 接孔同步触发外部的示波器

☒ 触发条件

☐ CMD / Resp. / Data

☒ CMD/RESP.
☐ Data

☐ VDD Drop

☐ End bit error

☐ CRC7 error

☐ CRC16 error

☐ CRC status Positive

☐ CRC status timeout

1

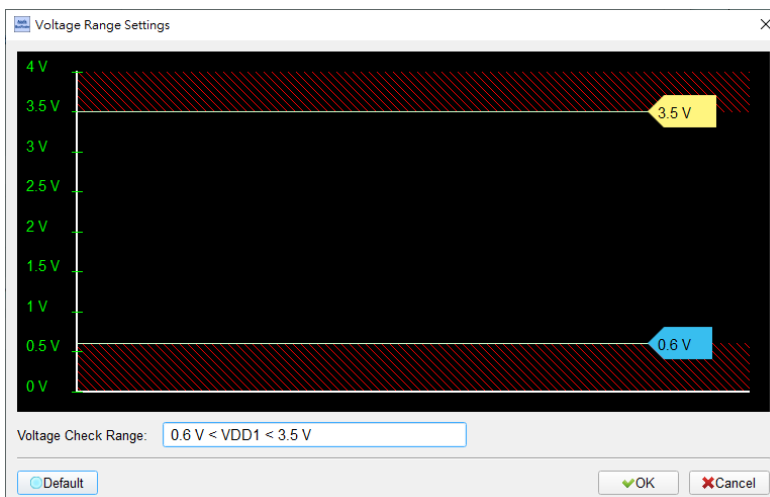
ns

Trigger Setting

Any Command

S	T	Command	(Description)
0	1	XXh	
Stuff Bits[31:24]			
		XXh	
Stuff Bits[23:16]			
		XXh	
Stuff Bits[15:8]			
		XXh	
Stuff Bits[7:0]			
		XXh	
CRC			
		XXh	1

☐ Default
 ☒ OK
 ☐ Cancel



2. SD 4.0

- 触发参数包含命令与参数数据可依据不同种类封包填入数值
- 涵盖所有 Command, Message, Response
- 可触发 CRC16, Packet Type Error
- 可触发 VDD1 Drop, VDD2 Drop
- 可通过 Trigger-Out 接孔同步触发外部的示波器

☒ 触发条件

CM TRAN	SD TRAN
☐ CCMD	☐ CCMD/DCMD
☐ DCMD	RES ☐ NACK=0
☐ MSG	☐ NACK=1
☐ RES	☒ No RES

☐ CRC16 Error
☐ Packet Type Error
☐ CMD25 Busy Period
☐ CMD18 Busy Period
☐ CMD38 Busy Period

☐ VDD1 Drop
☐ VDD2 Drop

☒ VDD Detect

VIII. 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

SD 3.0

Time	Timestamp (h:m:s.ms.us.ns.dns)	Event	Data	Information	Error message	Bus	Clock	CMD Duration	Data Duration
596	17:35:55.687.150.429.604.5	ACMD06 SET BUS WIDTH	46 00 00 00 02 CB				232.451 K	202.196us	
597	17:35:55.687.444.247.253.0	Resp6 R1	06 00 00 09 20 B9				Rrcr: 94	202.196us	
598	17:35:55.688.052.980.608.7	CMD16 SET_BLOCKLEN	50 00 00 02 00 15				232.446 K	202.196us	
599	17:35:55.688.304.798.253.0	Resp16 R1	10 00 00 09 00 0B				Rrcr: 11	202.196us	
600	17:35:55.688.954.350.647.5	CMD05 APP_CMD	77 AA AA 00 00 2B				14.8622 M	3.1596us	
601	17:35:55.688.958.316.3.96us	Resp55 R1	37 00 00 09 20 33				Rrcr: 11	3.1596us	
602	17:35:55.689.247.424.289.1	ACMD51 SEND_SCR	73 00 00 00 00 C7				14.8622 M	Rrcr: 4249	3.1596us
603	17:35:55.689.251.390.3.96us	Resp51 R1	33 00 00 09 20 91				Rrcr: 12	3.1596us	2.2231us
604	17:35:55.689.398.795.147.4	Read, 16 bytes	02 35 04 03 00 00 00 00...	SCr1 WaitTime:144.246us			4bit	Rrcr: 2147	
605	17:35:55.690.344.700.948.9	CMD06 SWITCH_FUNC	46 00 FF FF FF E3				14.8622 M	Rrcr: 12	3.1596us
606	17:35:55.690.348.937.4.23us	Resp6 R1	06 00 00 09 00 DD				Rrcr: 16	3.1596us	
607	17:35:55.692.145.894.781.6	Read, 64 bytes	00 64 00 04 00 04 00 0F...	SCr1 WaitTime:1.0124ms			4bit	Rrcr: 15046	9.74902us
608	17:35:55.692.145.894.781.6	CMD06 SWITCH_FUNC	46 00 FF FF F3 3B				14.8952 M	Rrcr: 15	3.1596us
609	17:35:55.692.145.894.781.6	Resp6 R1	06 00 00 09 00 DD				Rrcr: 15	3.1596us	
610	17:35:55.692.198.052.47.92	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SCr1 WaitTime:14.7655us			4bit	Rrcr: 666	9.74902us
611	17:35:55.692.856.662.698.8	CMD06 SWITCH_FUNC	46 00 FF FF F3 0D				14.8952 M	Rrcr: 15	3.1563us
612	17:35:55.692.861.095.4.23us	Resp6 R1	06 00 00 09 00 DD				Rrcr: 15	3.1596us	
613	17:35:55.694.732.735.1.53ms	Read, 64 bytes	00 C8 80 01 80 01 80 0F...	SCr1 WaitTime:1.8204ms			4bit	Rrcr: 27175	9.74902us
614	17:35:55.695.428.089.895.3	CMD06 SWITCH_FUNC	46 00 FF 3F FF 9F				14.8952 M	Rrcr: 33	3.1596us
615	17:35:55.695.433.448.5.37us	Resp6 R1	06 00 00 09 00 DD				Rrcr: 33	3.1596us	
616	17:35:55.695.917.396.283.9	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SCr1 WaitTime:280.76us			4bit	Rrcr: 4179	9.74902us
617	17:35:55.696.404.911.687.5	CMD06 SWITCH_FUNC	46 00 FF 3F FF A9				14.8622 M	Rrcr: 33	3.1596us
618	17:35:55.696.410.291.5.37us	Resp6 R1	06 00 00 09 00 DD				Rrcr: 33	3.1596us	
619	17:35:55.696.917.340.307.0	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SCr1 WaitTime:303.89us			4bit	Rrcr: 4523	9.75236us
620	17:35:55.701.189.949.4.24ms	CMD13 SEND_STATUS	4D AA AA 00 00 43				204.276 M	Rrcr: 33	229.977us
621	17:35:55.701.160.339.389.9	Resp13 R1	0D 00 00 09 00 3F				204.276 M	Rrcr: 33	226.644us
622	17:35:55.701.831.008.470.6	CMD13 SEND_STATUS	4D AA AA 00 00 43				204.276 M	Rrcr: Over	229.977us
623	17:35:55.701.831.398.389.9	Resp13 R1	0D 00 00 09 00 3F				Rrcr: 32	229.977us	

Navigation	Description	Tms	Bytes
CMD	489		
ACMD	84		
DATA	16533	8	8397134
Write SC of CMD24	0	8212	
Read SC of CMD17	5	2569	
Read SC of CMD18	58	8391632	
ERROR	28		

Statistics	Tms	Bytes
CMD08	8	
CMD55	84	
CMD11	3	
CMD02	5	
CMD03	5	
CMD09	5	
CMD07	5	
CMD13	119	
CMD16	5	
CMD06	17	
CMD17	5	
CMD12	60	
CMD36	1	
CMD45	2	
CMD19	1	

Ray Chien

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SD 4.0

Timestamp (h:m:s.ms.us.ns dur)	Host(D0)	Card(D1)	Dir/Event	Data	Information
15:05:39.736.225.630 013.0	SD0	SD0	DD	(2L-RD) Read Data	Address=00000000
15:05:39.736.227.309 001.6	DATA(S)	DATA(S)	DD		
15:05:39.736.227.333 023.0	ED0	ED0	DD		
15:05:39.736.227.343 009.0	STB.H	ED0	DD		
15:05:39.736.227.708 363.0	STB.H	DD	DD		
15:05:39.736.227.859 153.0	STB.L	DIR	DD		
15:05:39.736.228.399 538.0	DIR	DIR	DD		
15:05:39.736.228.603 203.0	DIR	DIDL	DD		
15:05:39.736.228.616 013.0	LIDL	DIDL	DD		
15:05:39.736.228.626 013.0	MSG(N)	DIDL	DD	STAT	CODE=00
15:05:39.736.228.693 063.0	MSG(N)	DIDL	DD	STAT	CODE=00
15:05:39.736.228.786 043.0	LIDL	DIDL	DD		
15:05:39.736.229.233 476.0	LIDL	LIDL	DD		
15:05:39.736.229.309 076.0	LIDL	MSG(N)	DD	MSG	IDR=0 CODE=00 DCMD=MSG DCR: 415.623us
15:05:39.736.229.373 063.0	LIDL	MSG(N)	DD	MSG	IDR=0 CODE=00
15:05:39.736.229.436 063.0	LIDL	LIDL	DD		
15:05:39.736.234.219 104.7	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	ARG=00002000 TLEN=1 Increment address
15:05:39.736.234.238 116.0	LIDL	LIDL	DD		
15:05:39.736.235.089 783.0	LIDL	RES(S)	DD	RL	RES=00000000
15:05:39.736.235.179 089.0	LIDL	LIDL	DD		
15:05:39.737.237.852 902.7	LIDL	MSG(N)	DD	FCREQ	CODE=00
15:05:39.737.238.018 046.0	LIDL	MSG(N)	DD	FCREQ	CODE=00

Line No.	Timestamp (h:m:s.ms.us.ns dur)	Host(D0)	Card(D1)	Dir/Event	Data	Information	Jump	Frequency
197	15:05:39.731.253.160 0	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 12 00 00 00 00...	A	
231	15:05:39.736.446.978 003.147ms	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 12 00 00 00 02...	B	
265	15:05:39.736.513.851 001.572ms	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 13 00 00 00 00...	B	
297	15:05:39.736.334.219 520.637us	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 12 00 00 20 60...	B	
329	15:05:39.736.334.219 520.637us	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 12 00 00 20 60...	B	
363	15:05:39.737.741.238 406.655us	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 12 00 60 20 06...	B	
396	15:05:39.739.351.077 001.60ms	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 12 00 5C 1C 60...	B	
443	15:05:39.742.534.275 003.183ms	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 12 00 00 20 06...	B	
492	15:05:39.746.508.928 003.974ms	DCMD(S)	LIDL	DD	CHD18 (READ MULTIPLE BLOCK)	11 00 40 12 00 00 20 06...	B	

IX. Settings

SD 3.0

协议设置

10BaseT1S
BiSS
CAN
DALI
DP-AUX
eDP
eMMC 5.1
eSPI
HID_I2C
I2C
I2S
LIN
MIO
MII
MIPI CSI
MIPI DSI
MIPI I3C
MIPI RFFE
MIPI SPMI
Modbus
NAND Flash
PMBus
Profibus
PWM
SD 3.0
SD 4.0
SGMII
SMBus
SPI
SVID
UART
UFS
USB 1.1
USB PD

采样率: 2.4 GHz 1
Primary Protocol Analyzer
 2
☒ SD 4 Probe
☐ SD 3 Probe
☐ Custom SD3.0
Secondary Protocol Analyzer or I/O 3
☒ NAND Flash NAND channel
☐ I/O

Filter 4
☐ Data Length > 512 bytes
☐ Number of blocks > 1 (SC > 1)
☒ 触发条件 5
☐ CMD / Resp. / Data
☒ CMD/RESP.
☐ Data
☐ End bit error
☐ CRC7 error
☐ CRC16 error
☐ CRC status Positive
☐ CRC status timeout
☐ VDD Drop 1 ns
设置 6
☐ 3 Pin mode (CMD, CLK, D0)
Tuning settings
Vendor CMD OFF
BUS mode settings at startup
☐ DDR mode
BUS width 4 bit
☐ CLK Detect 24ns
☐ VDD detect
SDIO Block Size

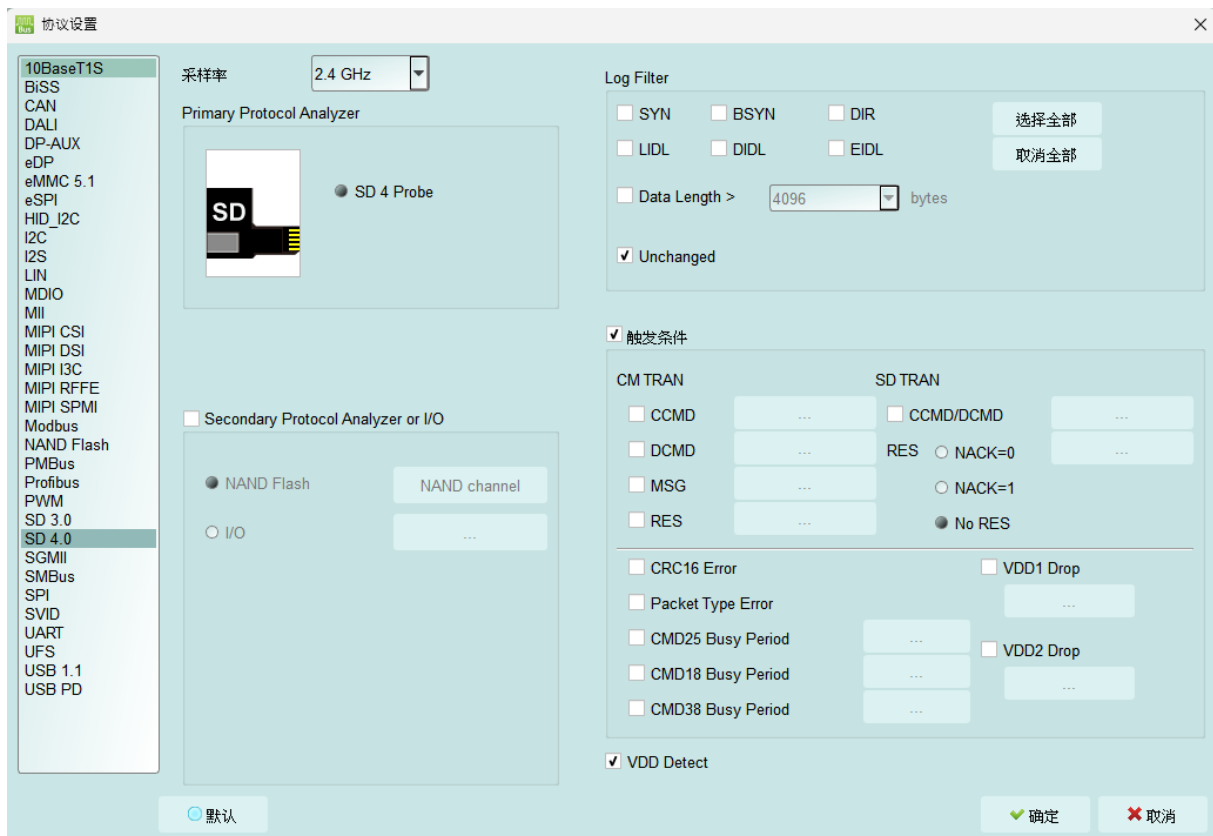
默认 确定 取消

- 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，

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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**

SD 4.0



FAQ

1. 支持 SD 第几版的规格？

A：支援到 SD3.0 SDR104, SD6.0 Legacy mode SDR104 / DDR200, SD4.0。

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

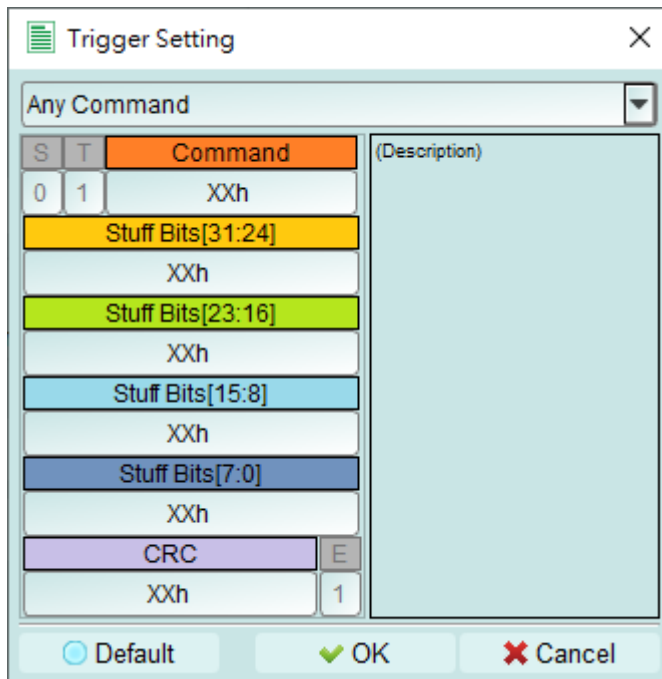
4. 量测时须注意的事项

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。

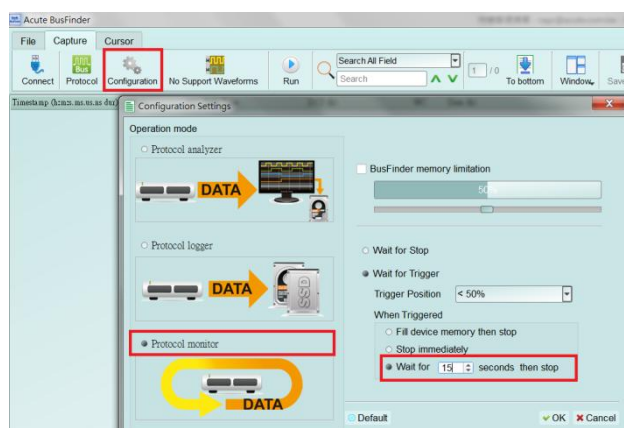
5. 有指定某个 SD 3.0 / SD 4.0 做为 trigger 点的功能吗？

A：可以指定特定的 SD 3.0 / SD 4.0 packet 或是 Error 进行触发。



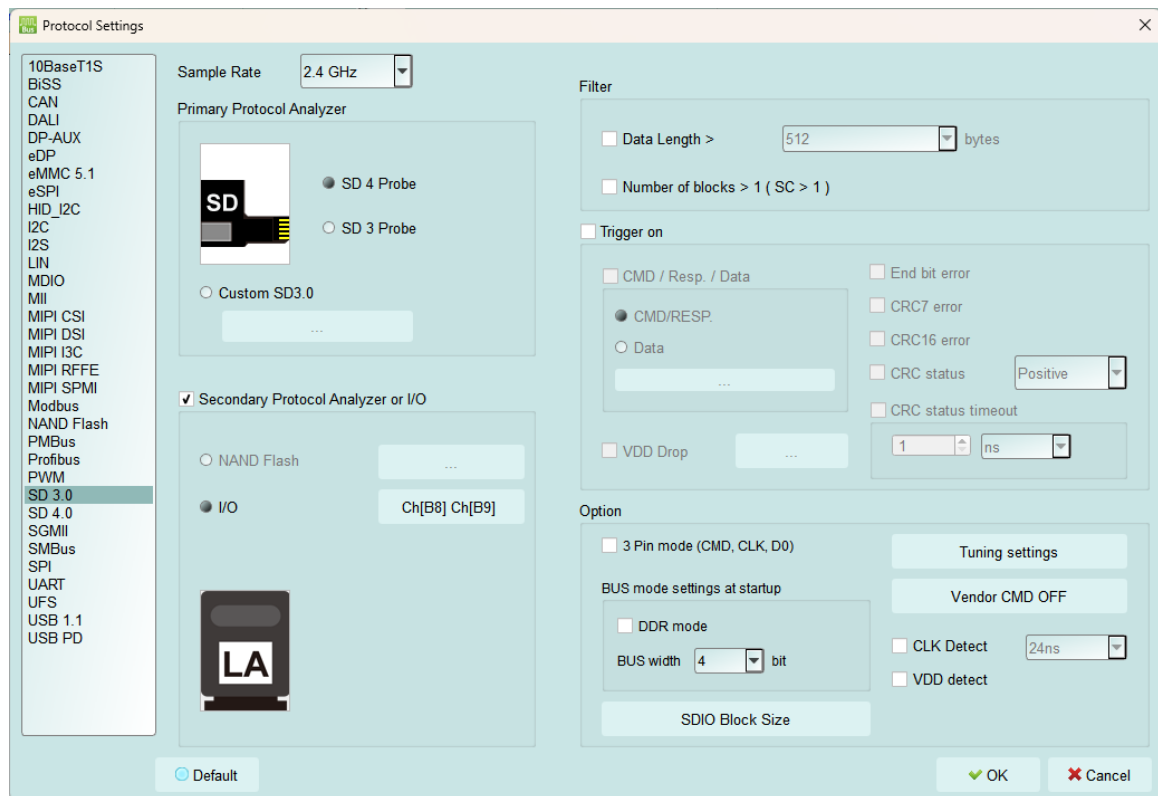
6. 是否可以自行设置一个 SD 3.0 / SD 4.0 起始点，指定抓取多少时间内的 Data？

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。



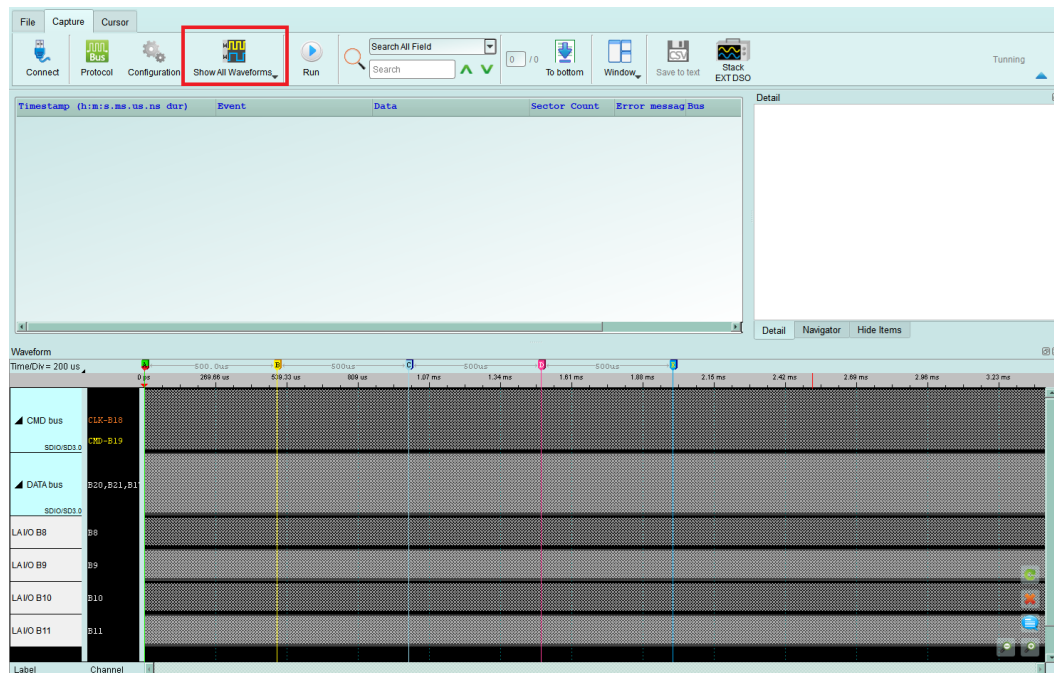
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7. Secondary Protocol Analyzer or I/O



在使用 SD3.0 协议分析仪的同时，可额外开启 NAND Flash 逻辑分析仪功能或是额外的 I/O 脚位进行分析。

使用此功能必须在协议分析仪主画面将显示波形开启才能使用。

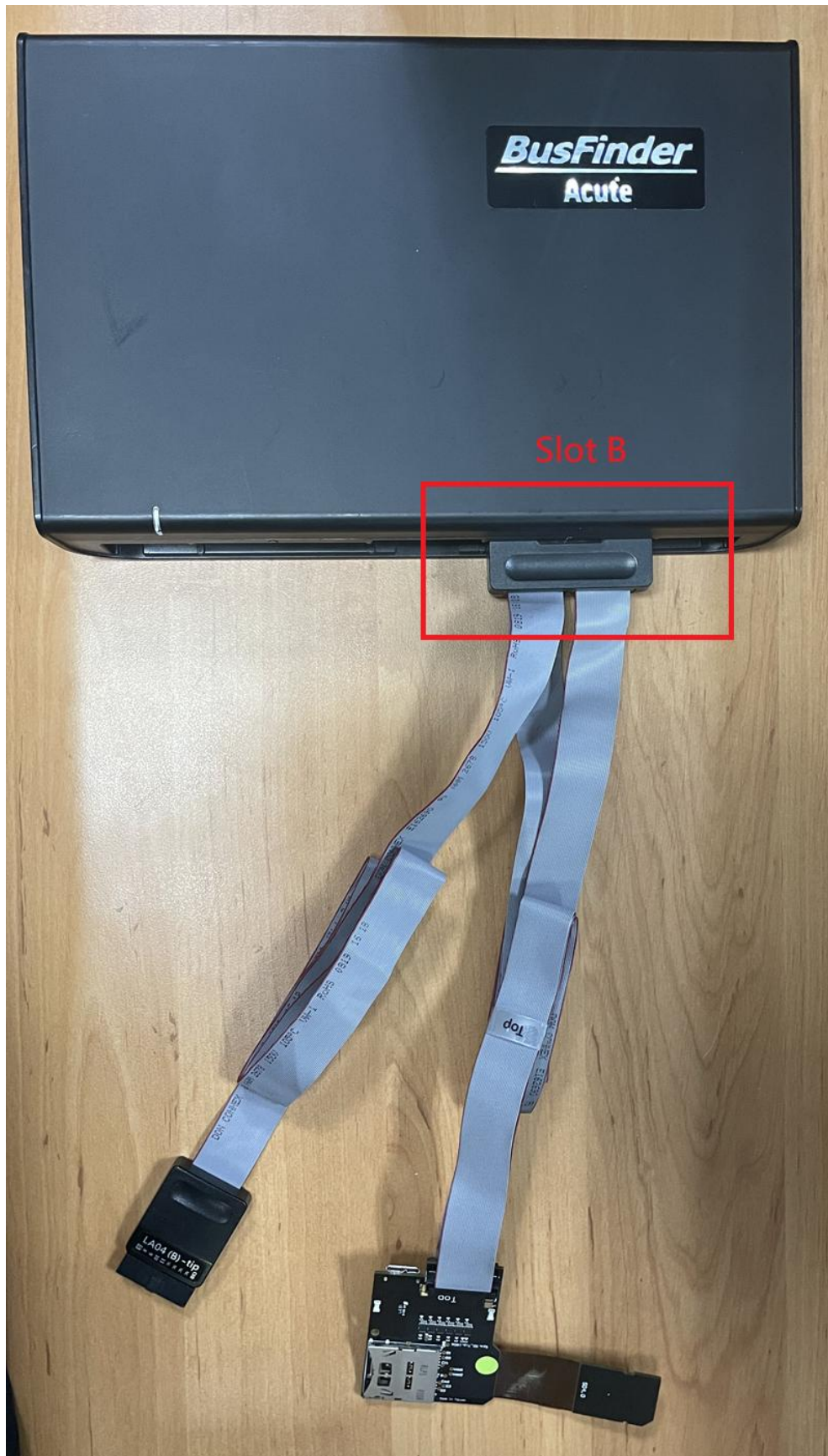


由于 NAND Flash 的分析需要使用更多的通道，因此需要一条 LA 探棒接于 Slot A，且仅能使用 1GHz 的采样率才能开启。

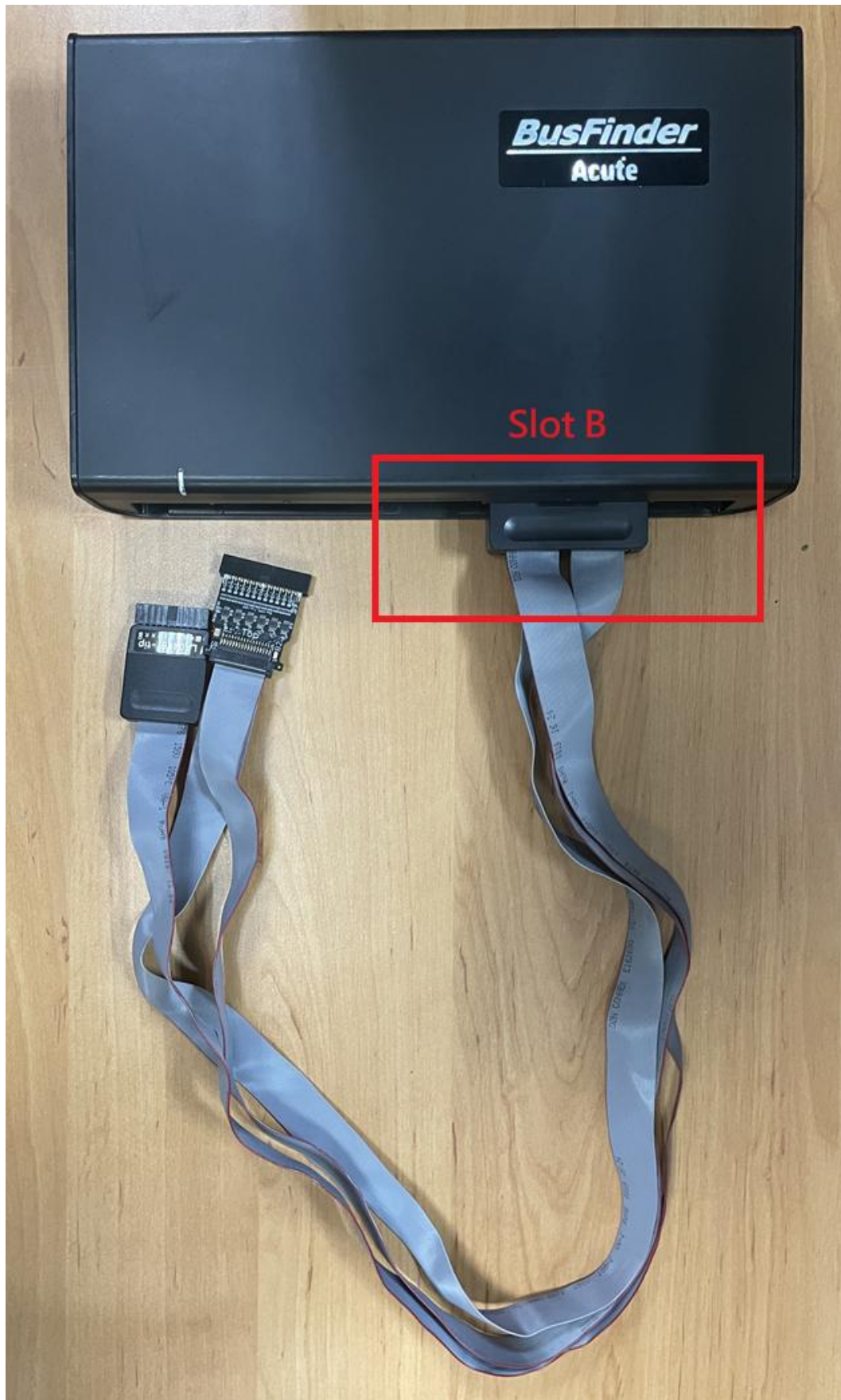
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主机与探头连接方式

主机仅能使用 Slot B 作为探头连接槽。

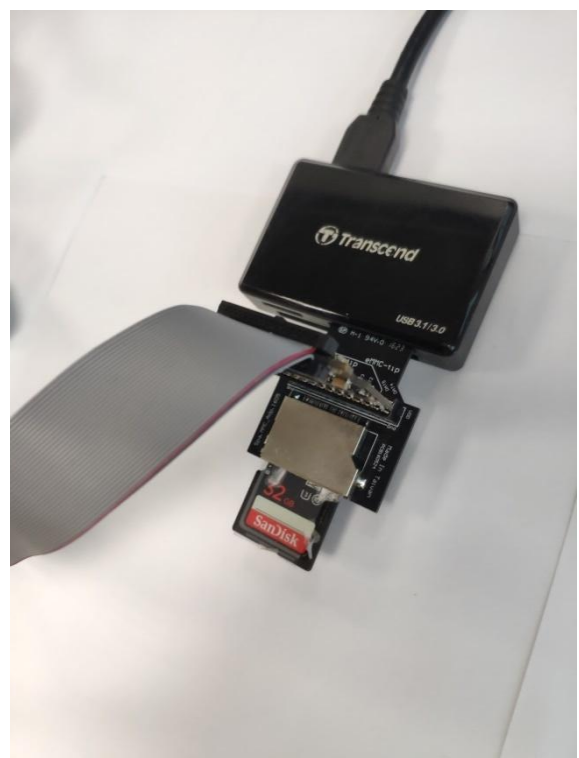


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探头与待测物连接方式

SD 3.0



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SD 4.0

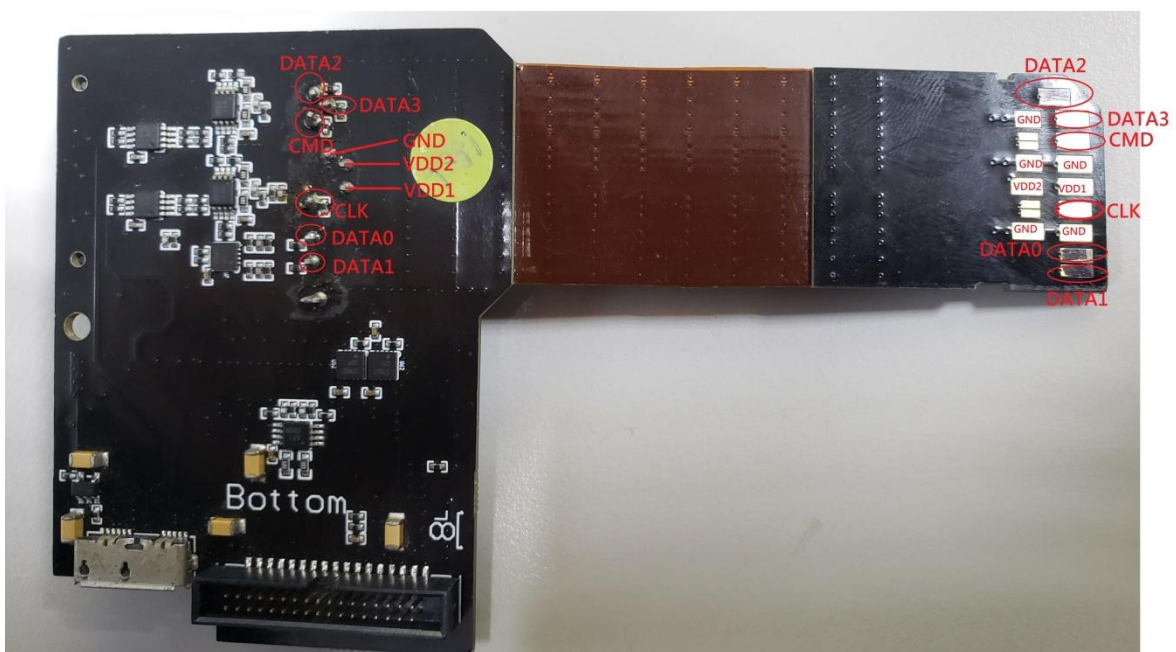


SD 4.0 比 SD 3.0 多了一条高速信号线，使用时须将信号线接上

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



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