

SD/eMMC Analyzer -- SGDK330B

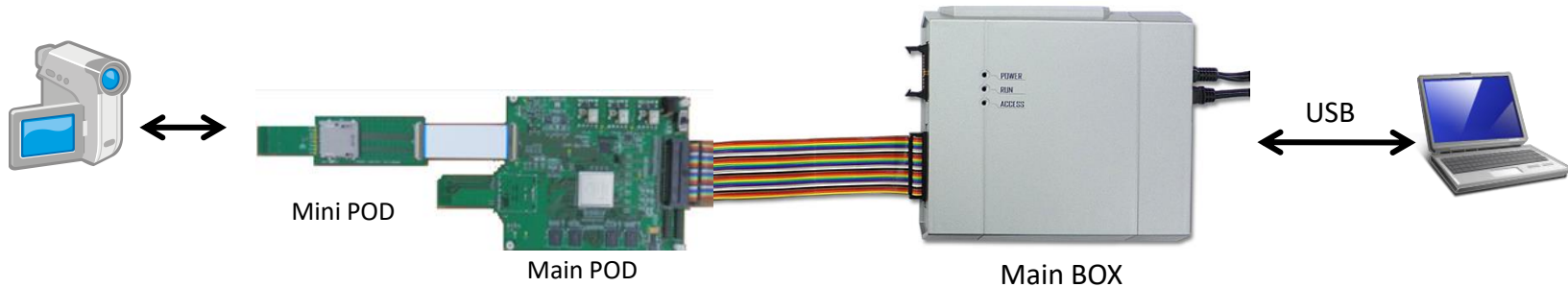


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Overview



- ❑ SGDK330B is controlled by application software installed in a PC.
- ❑ SGDK330B has only Analyzer function. It does not support SD Emulator/Tester function.
- ❑ Target Host is connected with SGDK330B through Mini PODs.
- ❑ SDA licensee can download application software to see log file.

Feature

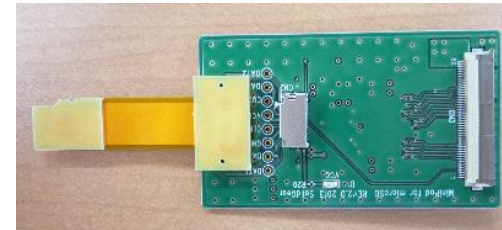
- **SGDK330B analyzes protocol between Host Product and Media.**
 - **SGDK330B supports**
 - ✓ **SD card ver3.00**
SDSC/SDHC/SDXC
UHS-I mode (208MHz)
 - ✓ **SDIO ver3.00**
 - ✓ **eMMC ver5.1**
4bit/8bit
HS400 / HS200 (200MHz)
- In some cases, Host product may not be able to access to media correctly at higher frequency because of influence of added capacitance of Mini POD.
- **SGDK330B captures signals, analyzes its protocol, and displays logged information to the PC screen in user friendly format.**
 - **Media access speed information, such as read latency and busy time, is displayed on the log.**
 - **User can define up to four commands, such as vendor unique command.**
 - **4 level sequence trigger is supported. Trigger events are “error condition (CRC error, status error)”, “address hit” , “long busy” or external trigger in.**

Mini POD

- Signals between Host and media are propagated to SGDK330B through Mini POD.



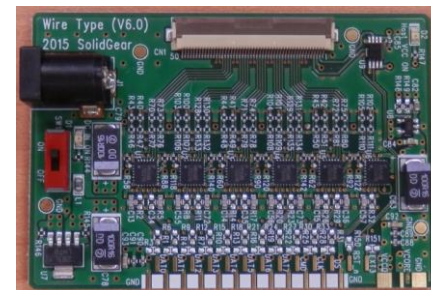
[Mini POD for SD card]



[Mini POD for micro SD card]



[Mini POD for eMMC/SDIO wire type]



[Wire type Mini POD for eMMC Rev6
(HS200/HS400)]

Sample LOG

002 ms	CMD18(...	ARG:0002A140 CRC:60	SC:8 IO=1.8V	SD :211.2MHz	Nrc:24
000 us	R1	RSP:1200000900D3 [47:0]	-	SD :-	Ncr:10
186 us	Read	2E202020 20202020 202020...	waitTime:186us	SD :4bit	Nac:38225
005 us	Read	00000000 00000000 000000...	waitTime:0us	SD :4bit	Nac:38
005 us	Read	00000000 00000000 000000...	waitTime:0us	SD :4bit	Nac:38
005 us	Read	00000000 00000000 000000...	waitTime:0us	SD :4bit	Nac:39
005 us	Read	00000000 00000000 000000...	waitTime:0us	SD :4bit	Nac:39
005 us	Read	00000000 00000000 000000...	waitTime:0us	SD :4bit	Nac:38
005 us	Read	00000000 00000000 000000...	waitTime:0us	SD :4bit	Nac:39
005 us	Read	00000000 00000000 000000...	waitTime:0us	SD :4bit	Nac:39
076 us	CMD12(...	ARG:00000000 CRC:30	SC:8 fromCMD:3...	SD :198.0MHz	Nrc:65153
000 us	Read	00000000 00000000 000000...	waitTime:0us	SD :4bit	Nac:27
000 us	R1b	RSP:0C00000B007F [47:0]	-	SD :-	Ncr:6
005 s	CMD13(...	ARG:35D00000 CRC:27	- IO=1.8V	SD :211.2MHz	Nrc:24
000 us	R1	RSP:0D000009003F [47:0]	-	SD :-	Ncr:6

[SD card UHS-I 208MHz]

718 ms	CMD52(IO_RW_...	ARG:80000E03 CRC:0A	write FN0 Ad...	SD :51.1MHz	Nrc:Ove
001 us	R5	RSP:340000100749 [47:0]	Data:07	SD :-	Ncr:7
001 ms	int assert	-	-	SD :-	-
018 ms	CMD53(IO_RW_...	ARG:28024610 CRC:36	Read Block F...	SD :51.1MHz	Nrc:Ove
000 us	int negate	-	-	SD :-	-
001 us	R5	RSP:35000010005B [47:0]	Data:00	SD :-	Ncr:7
000 us	Read	21230000 21230001 21230...	waitTime:1us	SD :8bit	Nac:57
004 us	Read	21230100 21230101 21230...	waitTime:1us	SD :8bit	Nac:65
004 us	Read	21230200 21230201 21230...	waitTime:1us	SD :8bit	Nac:65
004 us	Read	21230300 21230301 21230...	waitTime:1us	SD :8bit	Nac:65
004 us	Read	21230400 21230401 21230...	waitTime:1us	SD :8bit	Nac:65

[SDIO 8bit]

Sample LOG

003	s	CMD23(SET_BL...	ARG:00000040 CRC:73	-	MMC:51.1MHZ	Nrc:5352
001	us	R1	RSP:17000009001D [47:0]	-	MMC:-	Ncr:7
013	us	CMD18(READ_M...	ARG:0009820E CRC:0E	SC:64	MMC:51.1MHZ	Nrc:504
001	us	R1	RSP:1200000900D3 [47:0]	-	MMC:-	Ncr:9
484	us	Read	F8FFFF0F	waitTime:484us	MMC:8bit, DDR	Nac:24227
005	us	Read	81000000	waitTime:0us	MMC:8bit, DDR	Nac:14
005	us	Read	01010000	waitTime:0us	MMC:8bit, DDR	Nac:14
005	us	Read	81010000	waitTime:0us	MMC:8bit, DDR	Nac:14
005	us	Read	01020000	waitTime:0us	MMC:8bit, DDR	Nac:14
005	us	Read	81020000	waitTime:0us	MMC:8bit, DDR	Nac:14
005	us	Read	01030000	waitTime:0us	MMC:8bit, DDR	Nac:14

[eMMC 8bit DDR]

444	us	CMD18(READ...	ARG:0000CA88 CRC:09	SC:8	MMC:198.0MHZ	Nrc:19
000	us	R1	RSP:1200000900D3 [47:0]	-	MMC:-	Ncr:5
079	us	Read	88CA0000 62BBF967 35...	waitTime:79us	MMC:8bit, DDR	Nac:15865
001	us	Read	89CA0000 62BBF967 35...	waitTime:0us	MMC:8bit, DDR	Nac:8
001	us	Read	8ACA0000 62BBF967 35...	waitTime:0us	MMC:8bit, DDR	Nac:8
001	us	Read	8BCA0000 62BBF967 35...	waitTime:0us	MMC:8bit, DDR	Nac:8
002	us	Read	8CCA0000 62BBF967 35...	waitTime:1us	MMC:8bit, DDR	Nac:287
001	us	Read	8DCA0000 62BBF967 35...	waitTime:0us	MMC:8bit, DDR	Nac:8
001	us	Read	8ECA0000 62BBF967 35...	waitTime:0us	MMC:8bit, DDR	Nac:8
001	us	Read	8FCA0000 62BBF967 35...	waitTime:0us	MMC:8bit, DDR	Nac:8
001	us	CMD12(STOP...	ARG:0000FFFF CRC:55	SC:8 fromC...	MMC:198.0MHZ	Nrc:18318
000	us	R1b	RSP:0C00000B007F [47:0]	-	MMC:-	Ncr:5

[eMMC HS400]

SGDK330A vs. SGDK330B

	SGDK330A	SGDK330B
Data size which can be saved to LOG when HS400 mode	256Byte (half of one sector)	512Byte (full of one sector)
LOG memory size	256MB	1GB

- Because of hardware restriction of SGDK330A, it can save only 256Byte (half of one sector) information to LOG file when HS400 mode. On the other hand, SGDK330B can save full of one sector information.
- SGDK330B has 4 times LOG memory of SGDK330A.
- SGDK330A also can analyze eMMC HS400 mode if wire type Mini POD (Rev.6.x) is used, but please note that it can save only half of one sector information to LOG file when HS400 mode.