

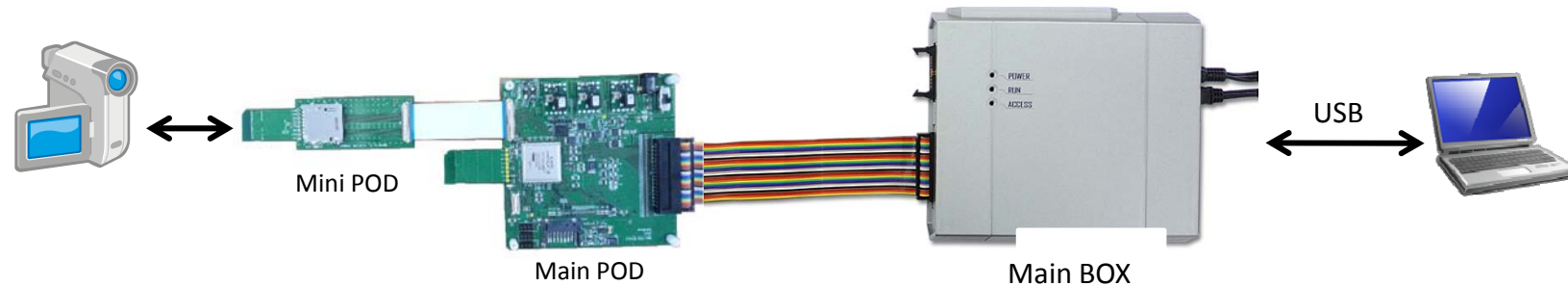
SD Host Tester -- SGDK320A

SolidGear

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Overview



- ❑ SGDK320A is controlled by application software installed in a PC.
- ❑ In Emulation mode, Target Host is connected with SGDK320A through SD connector form flexible cable.
- ❑ In Analyzer mode, Target Host is connected with SGDK320A through Mini PODs
- ❑ SGDK320A has following three functions.
- ❑ SGDK330A has only Analyzer function.

Function	SGDK320A	SGDK330A
(1) SD Card Emulator	√	
(2) Host Tester	√	
(3) SD/eMMC Analyzer	√	√

Feature (1) SD Card Emulator

□ SD Card Emulator

- **SGDK320A pretends SD Card to Host product in Emulation mode.**
- **SGDK320A can emulate**
 - **SDSC up to 2GB**
 - **SDHC up to 32GB**
 - **SDXC up to 2TB**

*** SPI mode, MMC card and SDIO are not supported in Emulation mode**
- **SGDK320A can emulate UHS-I media**
 - **SDR12/SDR25/SDR50**
 - **DDR50/SDR104**
- **Most of SD registers and parameters can be modified to emulate many kinds of SD Card including collapsed SD Card.**
- **exFAT is supported. SGDK320A can emulate SDXC cards up to 2TB in terms of File System.**
- **Error condition, such as CRC Error and Status Error, can be generated.**

Feature (2) SD Host Tester

□ SD Host Tester

- **SGDK320A tests whether Host Product is compliant to “Physical Test Specification for Host Products version 3.00”**
- **Before test, SGDK320A sets conditions of emulation such like SD register values and internal parameters for each selected test item by user.**
- **During test, SGDK320A captures signals of Host product. User has to do some operations, but these are very simple operations, such as mount, read data or write data.**
- **After test, SGDK320A analyzes protocol, and judges automatically whether Host product is compliant to test specification. SGDK320A displays its result (OK or NG) and logged protocol information on the PC screen. If result is NG, Error step is highlighted.**
- **SGDK320 Acovers logical test items only. SGDK320A cannot test electrical test items.**

Feature (3) Analyzer

➤ **SGDK320A analyzes protocol between Host Product and Media.**

➤ **SGDK320A supports**

✓ **SD card ver3.00**

SDSC/SDHC/SDXC

UHS-I mode (208MHz)

✓ **SDIO ver3.00**

✓ **eMMC ver4.51**

4bit/8bit

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.

➤ **SGDK320A captures signals, analyzes its protocol, and displays logged information to the PC screen in user friendly format.**

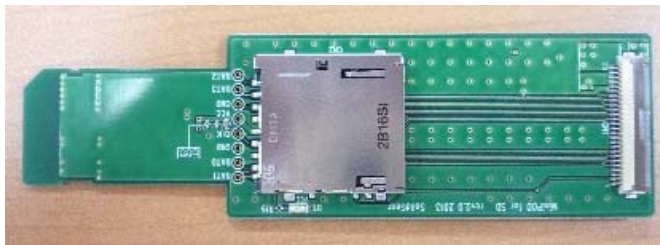
➤ **Media access speed information, such as read latency and busy time, is displayed on the log.**

➤ **User can define up to four commands, such as vendor unique command.**

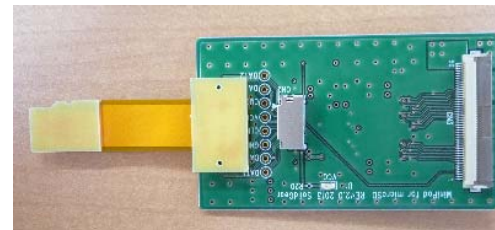
➤ **4 level sequence trigger is supported. Trigger events are “error condition (CRC error, status error)”, “address hit” ,“long busy” or external trigger in.**

Mini POD for Analyzer

- Signals between Host and media are propagated to SGDK320A through Mini POD. There are 4 kinds Mini POD. Mini POD for SD, for microSD, for eMMC/SDIO wire type and for eMMC socket type.



[Mini POD for SD card]



[Mini POD for micro SD card]



[Mini POD for eMMC/SDIO wire type]



[Mini POD for eMMC socket type]

Sample LOG of Analyzer

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 of Analyzer

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]

152	us	CMD23(SET_BL...	ARG:00000010 CRC:0E	-	MMC:211.2MHZ	Nrc:58099
000	us	R1	RSP:17000009001D [47:0]	-	MMC:-	Ncr:8
000	us	CMD18(READ_M...	ARG:00C66600 CRC:1D	SC:16	MMC:211.2MHZ	Nrc:17
000	us	R1	RSP:1200000900D3 [47:0]	-	MMC:-	Ncr:10
111	us	Read	28421800 50000000 2E010...	waitTime:111us	MMC:8bit	Nac:22275
002	us	Read	00000082 0700008F 07000...	waitTime:0us	MMC:8bit	Nac:28
002	us	Read	6E746966 69657320 74686...	waitTime:0us	MMC:8bit	Nac:28
002	us	Read	4F532069 73205570 67726...	waitTime:0us	MMC:8bit	Nac:29
002	us	Read	32352220 2F312E32 4D422...	waitTime:0us	MMC:8bit	Nac:28
002	us	Read	69732073 7570706F 72746...	waitTime:0us	MMC:8bit	Nac:28
002	us	Read	656E7420 42494F53 206C6...	waitTime:0us	MMC:8bit	Nac:29
002	us	Read	00000A00 00800308 00000...	waitTime:0us	MMC:8bit	Nac:29

[eMMC HS200]