SD Host Tester -- SGDK320A
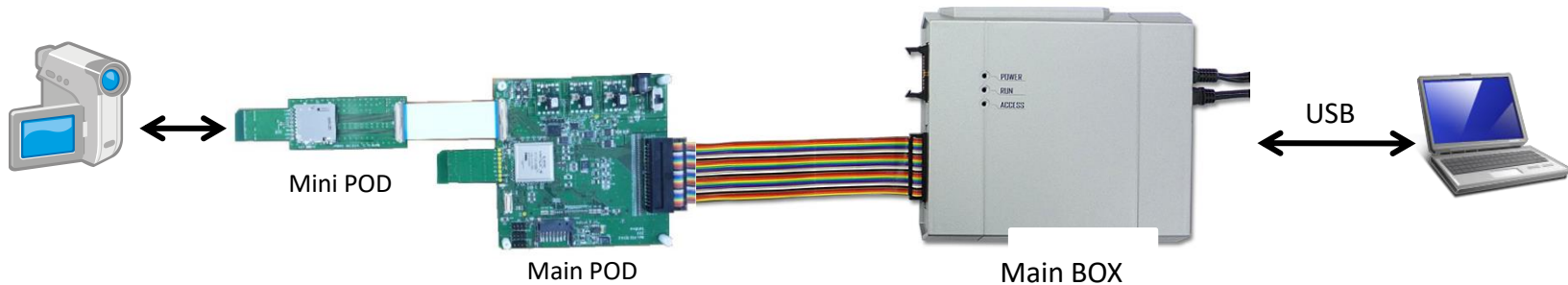
SolidGear

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Overview

Mini POD · Main POD · Main BOX · USB

- ☐ **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.**
- ☐ **SGDK330B has only Analyzer function.**

Function	SGDK320A	SGDK330B
(1) SD Card Emulator	√	
(2) Host Tester	√	
(3) SD/eMMC Analyzer	√	√

Feature (1) SD Card Emulator

☐ <u>SD Card Emulator</u>

- **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

- <u>**SD Host Tester**</u>
    - **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.**
    - **SGDK320A covers 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 eMMC(HS400) wire type.
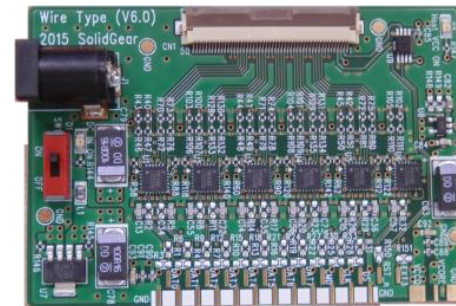
[Mini POD for SD card]
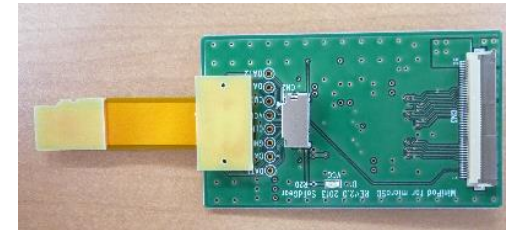
[Mini POD for micro SD card]

[Mini POD for eMMC/SDIO wire type]

[Mini POD for eMMC(HS400) wire type]

Sample LOG of Analyzer

[SD card UHS-I 208MHz]

[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]