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Feature:

This option is supported in BF6264B, BF7264B, and BF7264B+ ◦

Specifications:

1. BF7264B , 32Gb RAM , eMMC 5.1 probes



2. Supports eMMC 5.1

Up to eMMC 5.1 HS400

Standard*	Introduced	Sequential Read (MB/s)	Sequential Write (MB/s)	Random Read (IO/s)	Random Write (IOPS)
eMMC 5.1	2015	250	125	11,000	13,000
eMMC 5.0	2013	250	90	7,000	13,000
eMMC 4.5	2012	140	50	7,000	2,000

3. Can display eMMC protocol packet data in tabular form, including command parsing

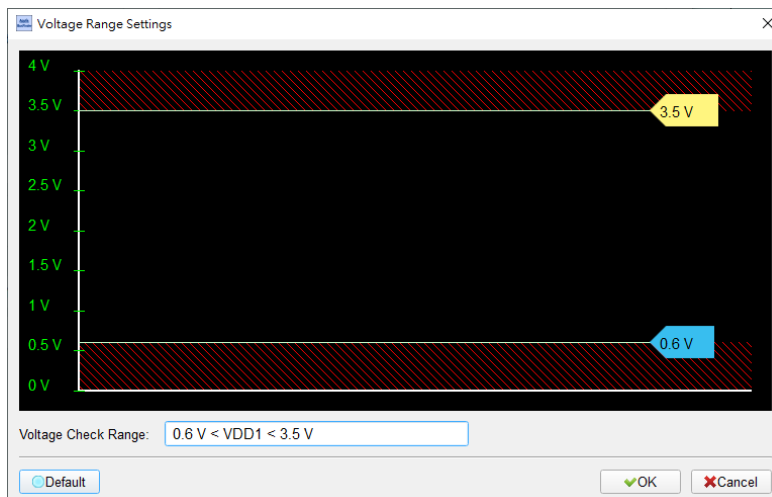
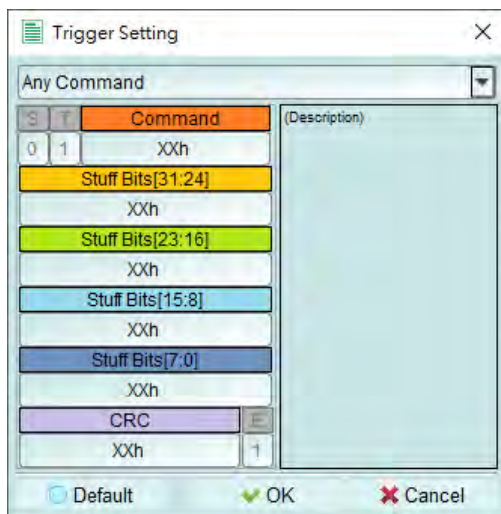
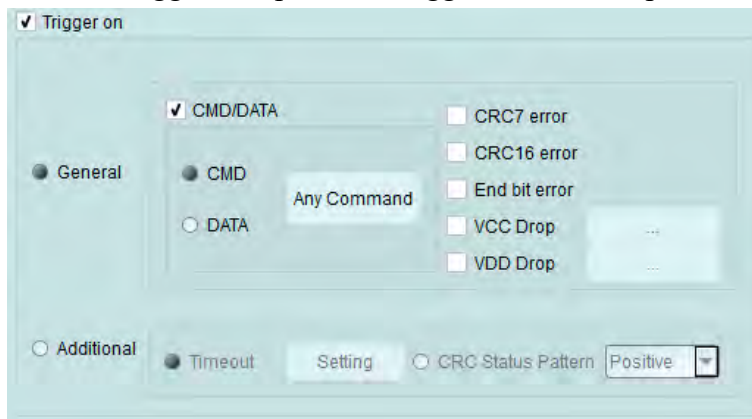
Timestamp (mm:ss.ms:ms:ms)	Event	Data	Information	Current state	Error message	Rtc	Clock	CMD Duration	Data Duration
15:04:40.513.388.768	CMD06 SWITCH	46 03 B9 03 01 11				20.8264 M	Ncc: 2802	2.25977us	
15:04:40.513.391.651	Resp06 Rib	06 00 00 05 00 CB		Tran			Ncc: 12	2.25977us	
15:04:40.513.391.988	Busy start								
15:04:40.513.407.373	Busy end		BusyTime:302.40us						
15:04:40.513.806.553	CMD13 SEND_STATUS	4D 00 01 00 00 53				20.8264 M	Ncc: 8593	2.25644us	
15:04:40.513.810.349	Resp13 Rl	0D 00 00 09 00 3F		Tran			Ncc: 32	2.25644us	
15:04:40.533.313.955	CMD06 SWITCH	46 03 A1 01 01 53				165.534 M	Ncc: Over	279.972ns	
15:04:40.533.314.469	Resp06 Rib	06 00 00 05 00 CB		Tran			Ncc: 33	279.972ns	
15:04:40.533.314.509	Busy start								
15:04:40.534.235.353	Busy end		BusyTime:924.874us						
15:04:40.534.306.218	CMD13 SEND_STATUS	4D 00 01 00 00 53				165.534 M	Ncc: Over	279.972ns	
15:04:40.534.306.693	Resp13 Rl	0D 00 00 09 00 3F		Tran			Ncc: 32	283.305ns	
15:04:40.534.451.945	CMD06 SWITCH	46 03 21 01 01 D9				165.534 M	Ncc: 2390	279.972ns	
15:04:40.534.452.325	Resp06 Rib	06 00 00 05 00 CB		Tran			Ncc: 33	279.972ns	
15:04:40.534.452.345	Busy start								
15:04:40.534.469.590	Busy end		BusyTime:17.2349us						
15:04:40.534.571.813	CMD13 SEND_STATUS	4D 00 01 00 00 53				165.438 M	Ncc: 20079	283.305ns	
15:04:40.534.572.204	Resp13 Rl	0D 00 00 09 00 3F		Tran			Ncc: 31	283.305ns	
15:04:40.534.694.107	CMD06 SWITCH	46 03 38 09 01 4F				165.438 M	Ncc: 20471	283.305ns	
15:04:40.534.694.587	Resp06 Rib	06 00 00 05 00 CB		Tran			Ncc: 33	283.305ns	
15:04:40.534.694.631	Busy start								
15:04:40.534.707.513	Busy end		BusyTime:13.162us						
15:04:40.534.813.509	CMD13 SEND_STATUS	4D 00 01 00 00 53				165.434 M	Ncc: 19638	279.972ns	
15:04:40.534.813.502	Resp13 Rl	0D 00 00 09 00 3F		Tran			Ncc: 32	283.305ns	
15:04:40.558.468.036	CMD23 SET_BLOCK_COUNT	57 00 00 00 08 8F				165.438 M	Ncc: Over	283.305ns	
15:04:40.558.468.514	Resp23 Rl	17 00 00 09 00 1D		Tran			Ncc: 32	283.305ns	
15:04:40.558.500.203	CMD18 READ_MULTIPLE_BLOCK	52 00 00 00 00 E1				165.534 M	Ncc: 5190	279.972ns	
15:04:40.558.500.683	Resp18 Rl	12 00 00 09 00 D3		Tran			Ncc: 33	279.972ns	
15:04:40.559.352.171	Read, 512 bytes	FA B8 00 10 8E D0 BC 00...	SC=1 WaitTime:851.205us			R3400			1.64317s
15:04:40.559.354.014	Read, 512 bytes	1E 00 00 00 00 00 00 00...	SC=2 WaitTime:199.95ns						1.64317s
15:04:40.559.355.861	Read, 512 bytes	53 3D 7D 55 CB CC C7 9E...	SC=3 WaitTime:203.313ns						1.63984s
15:04:40.559.357.711	Read, 512 bytes	32 71 E7 15 2C 34 5B E5...	SC=4 WaitTime:206.979ns						1.63984s
15:04:40.559.359.557	Read, 512 bytes	D7 3D 2F 71 93 90 05 30...	SC=5 WaitTime:206.646ns						1.64317s
15:04:40.559.361.407	Read, 512 bytes	DC DA B2 28 1A 01 2D 7E...	SC=6 WaitTime:206.646ns						1.64317s
15:04:40.559.363.257	Read, 512 bytes	63 E7 99 B6 4F 3C 22 A2...	SC=7 WaitTime:206.646ns						1.64317s
15:04:40.559.365.107	Read, 512 bytes	EA A8 B1 70 B3 E1 50 F5...	SC=8 WaitTime:206.646ns						1.64317s
15:04:40.563.939.219			WaitMax:851.205us Min:199.95ns						Sector 1
15:04:40.563.939.702	CMD06 SWITCH	46 03 B3 4A 01 05				165.534 M	Ncc: Over	283.305ns	
15:04:40.563.939.702	Resp06 Rib	06 00 00 05 00 CB		Tran			Ncc: 33	279.972ns	
15:04:40.563.939.742	Busy start								

- Use 32Gb RAM as the buffer to stream all eMMC data into the SSD HD in order to record all data flow from Low Power Mode to High Speed Mode.
- “Data Filter” filters unwanted data to save memory.
- “Search” searches specific data.
- “CRC Packet” displays and counts CRC
- eMMC command statistics include numbers of packets, individual command, different data length, and errors

Navigator			Statistics	
Description	Txns	Bytes	Txns	Bytes
Command	14442	693216	CMD00	4
Data	539533	276233832	CMD08	7
Error	21		CMD55	5
▼ Sector Count			CMD01	29
CMD17	55	28160	CMD02	2
CMD18	7021	275227264	CMD03	2
CMD24	3	1536	CMD09	2
CMD25	40	344064	CMD13	114
Wait Data Time(ns)			CMD07	2
Busy Time(ns)			CMD06	69
			CMD16	1
			CMD17	55
			CMD18	7021
			CMD12	30
			CMD52	2
			CMD05	4
			CMD21	8
			CMD23	7042
			CMD25	40
			CMD24	3
				144

9. eMMC command trigger

- a. Trigger parameters include commands and data in order to cover all kinds of packets.
- b. Command or 16 byte Data.
- c. CRC7, CRC16, End Bit Error.
- d. Data to Data timeout, CRC Status timeout, CRC Status pattern, Busy timeout.
- e. VCC drop, VCCQ2 drop.
- f. The Trigger-Out port is to trigger a DSO to capture waveforms.

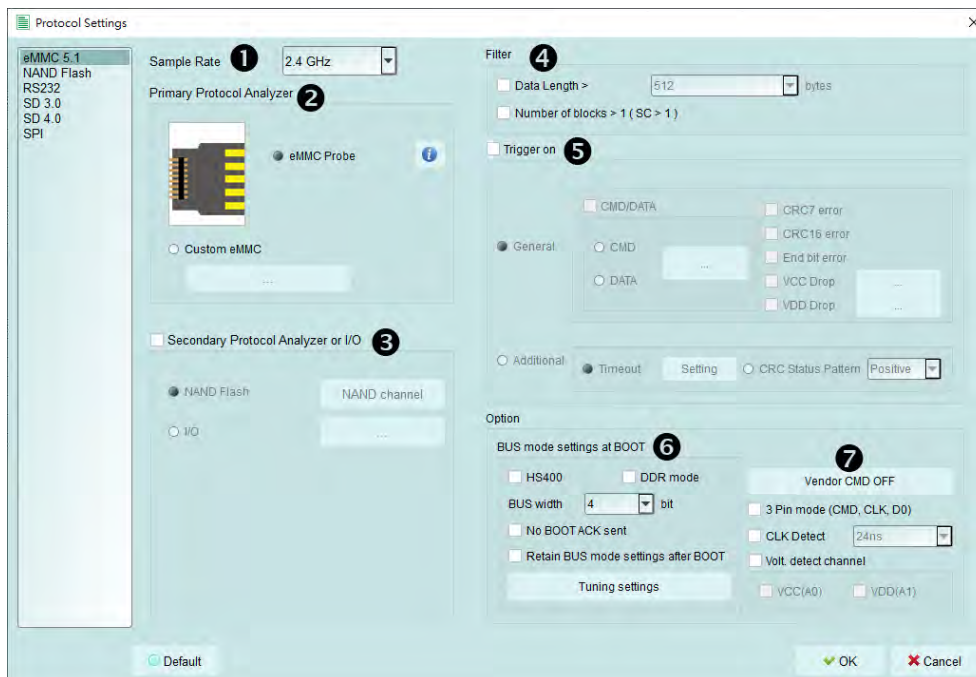


10. Report area

Statistics list: Quickly categorize and track the location of data with statistical functions.

Line No.	TimeStamp (h:m:s.ms.us.ns)	Event	Data	Information	Current state	Error message	Bus	Clock	CMD	Duration	Description
29375	10:59:27.334.846.802.1.51ms	CMD06 SWITCH	46 03 89 02 01 07				385.436 M	Mzcr: 53	121.924us		
29924	10:59:27.440.613.407.0.00ms	CMD06 SWITCH	46 03 88 00 01 69				145.534 M	Mzcr: Over:	279.972us		
29432	10:59:27.441.734.215.127.07ms	CMD06 SWITCH	46 03 89 01 01 30				145.534 M	Mzcr: 20983	279.972us		
29433	10:59:27.442.020.897.0.00ms	CMD06 SWITCH	46 03 87 06 01 50				10.6264 M	Mzcr: Over:	2.25us		
29444	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29445	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29446	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29447	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29448	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29449	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29450	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29451	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29452	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29453	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29454	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29455	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29456	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29457	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29458	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29459	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		
29460	10:59:27.470.984.263.1.13ms	CMD06 SWITCH	46 03 89 03 01 11				20.7813 M	Mzcr: 2732	2.2544us		

11. eMMC settings



1. **Sample Rate:** Choose the sampling rate to use. To enable the Secondary Protocol Analyzer – NAND Flash option, the sampling rate must be set below 1GHz,
2. **Primary Protocol Analyzer:** Can choose to use the probe type, can also customize the channel / trigger level,
3. **Secondary Protocol Analyzer or I/O:** An additional set of specified logic analysis can be opened to analyze the remaining available pins at the same time,
4. **Filter:** Each Data Frame can specify the size of the collection, and data larger than the set value will not be recorded
5. **Trigger on:** CMD, DATA, ERROR, Voltage, Timeout, CRC Status trigger conditions can be set
6. **Startup:** It needs to be set to the mode of the current acquisition, the mode of the test object is running, and has the Tuning function.
7. **Other options:**
 - a. **Vendor CMD:** Can change the name of the command group by itself, with or without information,
 - b. **3 Pin mode:** After connecting CLK, CMD, D0, the protocol flow and status agreement can be analyzed,
 - c. Mainly used for test objects with difficult wiring or non-data errors,
 - d. **CLK Detect:** Can detect whether CLK has action,
 - e. **Two sets of voltage detection function**

FAQ

1. What eMMC version is supported?

A : Support eMMC 5.1 HS400 / HS200 / CMD Queue.

2. Will the signal quality be affected during measurement?

A: The measurement of the external instrument will inevitably have some load effect. We use the active probe to reduce the interference of the object to be measured and improve the signal quality.

3. Is Tx supported?

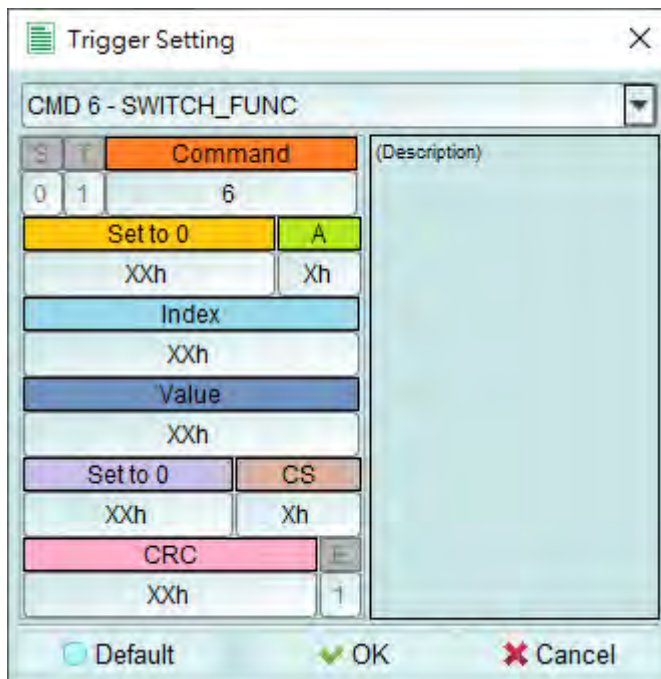
A: No

4. Precautions during measurement

Please make sure to connection according to the “Probe and test object connection” on page 9.

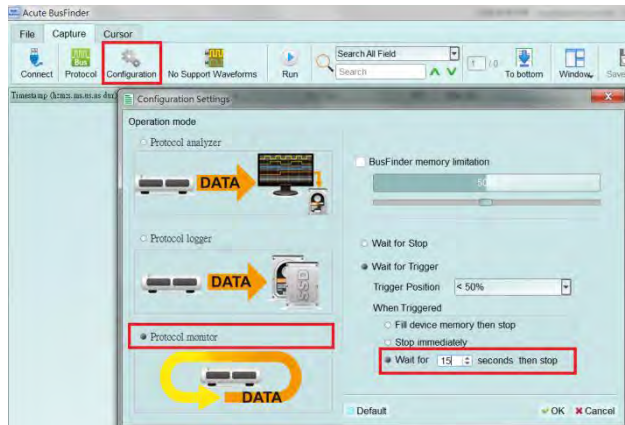
5. Can I specify an eMMC packet as the trigger point function?

A: You can specify specific eMMC packet or Error to trigger.



6. Is it possible to set an eMMC starting point, and specify how much time to capture Data?

A: You can set the starting condition to the trigger item and adjust to the data monitor mode in the working mode menu. And specify the length of acquisition time.



Probe and test object connection

