

# eMMC Solution (Flyer)

#### eMMC 5.1 Protocol Analysis

The embedded MultiMedia Card(eMMC) is the flash memory standard set by the MMC Association for mobile phones and tablets. It is an embedded multimedia memory card packaged into a BGA chip.

eMMC is made using parallel transmission technology. Although data reading and writing must be performed separately, it has the advantages of small size, low wiring difficulty, and high integration. eMMC is obviously different from other versions of MMC, because eMMC is not a card that users can move at will, but a permanent circuit board accessory. If eMMC has a problem with the memory or its controller, it may be necessary to replace the entire PCB (printed circuit board) to repair it.

### **Features**

TravelLogic & MSO series support eMMC / MMC Trigger、Bus decodes (According to the optional model)

 The 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

This option is supported in BusFinder BF7264B, and BF7264B+

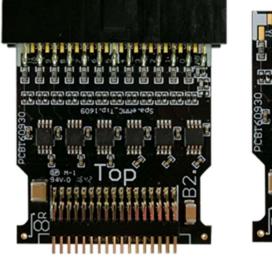
 Can display eMMC/MMC 5.1 protocol packet data in tabular form, including command parsing

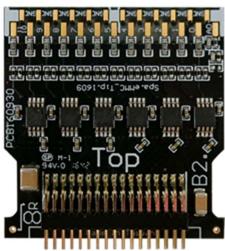
- eMMC/MMC 5.1 command statistics include numbers of packets,

individual command, different data length, and errors

- eMMC/MMC 5.1 command trigger

\*BusFinder eMMC solution provides 2 different adapters:





# 3-Pin Mode

	Div = 20 us	A2 9	19 ms 63.01 m	ns 63,83 ms	62.05 ms 62.03	7 ms	63.69 ms	62	11 ms	92	. 456ms	60.15 ms		12.17 ms	63,19	m/s	63.21 ms		63.23 ms	60	25 ms	63.27 ms	63.29 ms
Acqu	ired: 18:03:18.985	1 1 1 1							1	1 1				1			1				1.		1 .
		0Ah	0Ah	0Ah 0A	h 0Ah	00h	1.	00h	AC	)h .	D5h	(	)1h	00	h	12h	0	Ch	07	'n	08h	10h	01h
										Intelate											nonn		- Intelateda
	CLK-0																						
⊿ BL	IS_MMC	10000000					ицици		11000	UUUU			UUUU		UUUUU			ициц	10000	UUUU			UUUUU.
	CMD-1																						
		пп	пп	nn n	п пп				п		пп	п	П		пп	пп						п	
	MMC Data0-2	1:	2.5 u   12.	5 u   12.5 u	12.5 u	42	2.5 us		12	.5 u		17.5	us	10 us			12.5 u	17	.5 us	10	) us 👘	15 us	
									<u> </u>														
	31. 3 <u>1.</u>																						• •
Labe	Channel	•	2 - E																				
CH-00	Bus BUS_MMC(MMC)																Q Se	arch All Fie	lds		Text in	cludes	
	Timestamp (hh:mm:ss.ms.us.	.ns)	Command		Response	Arg	ument / Dat	a Block 1 (h	)		Data Blo	ck 2 (h)			Data Blo	ck 3 (h)			Data	Block 4 (h)		CRC (h)	Freq
43	18:03:19.411.484.70	)2		D[256:	287]	31 2E	33 30	20 20	00	08 08	08 01	01 01	00	00 00	00 00	00 00	00	00 00	00 0	0 00	00 00		
44	18:03:19.412.124.70	02		D[288:	319]	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 0	00 00	00 00		
45	18:03:19.412.764.70	)2		D[320:	351]	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 0	0 00	00 00		
46	18:03:19.413.404.70	)2		D[352:	383]	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 0	00 00	00 00		
47	18:03:19.414.044.70	)2		D[384:	415]	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 0	0 00	00 00		
48	18:03:19.414.684.70	3		D[416:	447]	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 0	0 00	00 00		
49	18:03:19.415.324.70	)3		D[448:	479]	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 00	00 00	00	00 00	00 0	00 00	00 00		
50	18:03:19.415.964.70	3		D[480:	511]	00 00	00 00	00 00	00	00 00	00 10	00 03	03	05 03	03 01	3F 3E	01	01 00	00 0	0 00	00 00		
51	18:03:19.416.464.70	3																				CRC16 OK	1
52	18:03:19.421.149.29	5 SC	=1	D[0:31	]	FE FE	FE FE	FE FE	FE 1	FE FE	FE FE	FE FE	FE	FF FE	FE FE	FF FF	FE	FE FE	FF H	E FE	FF FE		
53	18:03:19.421.149.61	.5		D[32:6	3]	FE FE	FE FF	FE FE	FF	FF FE	FE FF	FE FE	FF	FF FF	FE FE	FE FE	FF	FE FE	FE H	E FE	FE FF		
54	18:03:19.421.149.93	35		D[64:9	5]	FE FE	FF FF	FE FE	FE	FE FF	FE FE	FE FE	FE	FE FE	FE FE	FE FE	FE	FE FE	FE H	E FE	FE FE		

# No Clk Mode

Time/Div = 20 ns,	<b>9</b>				1.16us				
Acquired: 05:52:22.051	23.39 ms	23.39 ma 2	0.39 ms 23.39 ms 23.39 m	a 23.39 ma 23.3	8 ms 23.39 ms 23.39	ms 23.39 ms	23.39 ms 23.39 ms	23.39 ms 23.39 ms 23.39 ms	23.39 ms
* DUG 1440	R1:CMD23:SE	LOCK_	Data:00h	Data:00h	Data:09h		Data:00h	CRC:0Eh	
A BUS_MMC	16.5 ns 19 ns			119 ns	7 n	8 ns	64.5 ns	19 ns	
15, <i>1</i> 6									• •
Label Channel	•								
CH-00 Bus BUS_MMC(MMC)	lu. 🖻 🏱							Q Search All Fields 🔽 Text includes	Ex 🔨
Timestamp (hh:mm:ss.ms.us.	uns)	Command	Response	Ar	gument (h) CRC7 (h)	Frequency Timin	g Information		
1 05:52:24.826.423.2	272 CMD23:S	ET BLOCK COUL	NT	00 00	00 08 5F	165MHz			
2 05:52:24.826.423.7	755		R1 :CMD23:SET BL	OCK COUNT 00 00	09 00 0E	165MHz Ncr:	32		

## eMMC Packet

Tame	stanış (Jemes ma uz na dur)	Event	Dete	Information	Current state	Error message	Bus	Clock	CMD Dumbon	Dete Duration	細胞	88
34821	15:04:40.513.388.768 1.	CHD06 SWITCH	46 03 89 03 01 11				20.8264 M	Nrc: 2802	2.25977us		CMD06 SWITCH	
34822	15:04:40.513.391.651 2.	Resp06 R1b	06 00 00 08 00 CB		Tran			Ncr: 12	2.25977us			
34823	15:04:40.513.391.988 3.	Busy start									[25:24] Access= Write Bits(3) [23:16] Index= HS TIMING(185)	
34824	15:04:40.513.694.467 3.	Busy end		BusyTime: 302.48us							[15:12] Selected Driver Strength(0)	
34825	15:04:40.513.806.553 1.	CMD13 SEND_STATUS	4D 00 01 00 00 53				20.8264 M.	Nrc: 8593	2.25644us		[11:8] Timing Interface= HS400(3)	
34826	15:04:40.513.810.349 3.	Resp13 R1	0D 00 00 09 00 3F		Tran			Nor: 32	2.25644us		[2:0] Cmd Set= 1	
34827	15:04:40.533.313.985 1.	CMD06 SWITCH	46 03 A1 01 01 53				165.534 M.	Nrc: Over	283.305ns			
34828	15:04:40.533.314.469 4.	Resp06 R1b	06 00 00 08 00 CB		Tran			Nor: 33	279.972ns		[CRC7] = 08h (8b:11h)	
34829	15:04:40.533.314.509 3.	Busy start									A CONTRACTOR OF	
348.90	15:04:40.534.239.383 9.	Busy end		BusyTime:924.874us							[Raw Data]	
34831	15:04:40.534.306.219 6.	CHD13 SEND_STATUS	4D 00 01 00 00 53				165.534 M.	Nrc: Over	279.972ns		0 1 2 3 4 5 6 7 ASCII 0h 46 03 B9 03 01 11 F	
34832	15:04:40.534.306.693 4.	Respl3 R1	0D 00 00 09 00 3F		Tran			Ncr: 32	283.305ns		01 40 03 59 03 01 11 2	
34833	15:04:40.534.451.845 1.	CHD06 SWITCH	46 03 21 01 01 D9				165.534 M.	Nrc: 23980	279.972ns			
34834	15:04:40.534.452.325 4.	Resp06 R1b	06 00 00 08 00 CB		Tran			Ncr: 33	279.972ns			
34835	15:04:40.534.452.365 3.	Busy start										
34836	15:04:40.534.469.590 1.	. Busy end		BusyTime: 17.2249us								
34837	15:04:40.534.571.813 1.	CMD13 SEND_STATUS	4D 00 01 00 00 53				168.438 M	Nrc: 20079	283.305ns			
34838	15:04:40.534.572.286 4.	Resp13 R1	0D 00 00 09 00 3F		Tran			Nor: 31	283.305ns			
34839	15:04:40.534.694.107 1.	CMD06 SWITCH	46 03 38 08 01 4F				168.438 M.	Nrc: 20471	283.305ns			
34840	15:04:40.534.694.587 4.	Resp06 R1b	06 00 00 08 00 CB		Tran			Nor: 33	283.305ns			
34841	15:04:40.534.694.631 4.	. Busy start										
34842	15:04:40.534.707.813 1.	Busy end		BusyTime:13.182us								
34843	15:04:40.534.813.509 1.	CHD13 SEND_STATUS	4D 00 01 00 00 53				165.534 M.	Nrc: 19638	279.972ns			
34844	15:04:40.534.813.982 4.	Respl3 R1	0D 00 00 09 00 3F		Tran			Ncr: 32	283.305ns			
34845	15:04:40.558.468.036 2.	CHD23 SET_BLOCK_COUNT	57 00 00 00 08 BF				168.438 M	Nrc: Over	283.305ns			
34846	15:04:40.558.468.516 4.	Resp23 R1	17 00 00 09 00 1D		Tran			Ncr: 32	283.305ns			
34847	15:04:40.558.500.203 3.	CHD18 READ_MULTIPLE_BLOCK	52 00 00 00 00 E1				165.534 M	Nrc: 5198	279.972ns			
34848	15:04:40.558.500.683 4.	Respi8 Ri	12 00 00 09 00 D3		Tran			Ncr: 33	279.972ns			
34849	15:04:40.559.352.171 8.	Read, 512 bytes	FA B8 00 10 8E D0 BC 00	SC=1 WaitTime:851.208us			HS400			1.64317		
34850	15:04:40.559.354.014 1.	Read, 512 bytes	1E 00 00 00 00 00 00 00	SC=2 WaitTime:199.98ns						1.643171		
34851	15:04:40.559.355.861 1.	Read, 512 bytes	53 3D 7D 55 C3 CC C7 9E	SC=3 WaitTime:203.313ns						1.63984		
34852	15:04:40.559.357.711 1.	Read, 512 bytes	33 71 E7 15 2C 34 5B E9	SC=4 WaitTime:209.979ns						1.639841		
34853	15:04:40.559.359.557 1.	Read, 512 bytes	D7 3D 2F 71 93 98 05 38	SC=5 WaitTime:206.646ns			0			1.64317:		
34854	15:04:40.559.361.407 1.	Read, 512 bytes	DC DA B2 28 1A 01 2D 7E	SC=6 WaitTime:206.646ns						1.64317		
34855	15:04:40.559.363.257 1.	Read, 512 bytes	63 E7 99 B5 6F 3C 22 A2	SC=7 WaitTime:206.646ns						1.64317:		
34856	15:04:40.559.365.107 1.	Read, 512 bytes	EA A8 B1 70 B3 E1 50 F5	SC=8 WaitTime:206.646ns						1.64317		
34857	15:04:40.563.939.219 4.			WaitMax:851.208us Min:199.98ns						Sector 1		
34858	15:04:40.563.939.219 0.	CMD06 SWITCH	46 03 B3 4A 01 05				165.534 M.	Nrc: Over	283.305ns			
34859	15:04:40.563.939.702 4.	Resp06 R1b	06 00 00 08 00 CB		Tran			Ncr: 33	279.972ns	-		
34890	15:04:40.563.939.742 3.	. Busy start								*		
							3			<b>P</b>	細節 統計 睡候資料	

### **Pin Connection**



\* Suggestion : The bonding wire distance is about 3cm (the shorter the better), and 100~75 ohm resistance can be added for anti-reflection to improve the measurement quality.