

BF7264B+ MIPI M-PHY analyzer UFS2.1



Index

Feature:	2
FAQ	9
Probe and test object connection	
Way Station connection	17



Feature:

The BF7264B+ is the Solution of UFS. It provides the protocol analyzer function of MIPI M-PHY UFS2.1 (supports UFS3.1 commands).

Specifications:

1. BF7264B+, 32Gb RAM, MIPI M-PHY UFS2.1 Probes



2. Fully supports MIPI M-PHY UFS2.1, and support UFS3.1 commands. MIPI M-PHY 3.0, Up to 5.8Gbps (Gear 3, Rate A / B), 2 Lanes MIPI Unipro 1.8 JEDEC UFS 2.1 JEDEC UFS 3.1 commands



3. Can simultaneously display Unipro or UFS protocol packet data in tabular form, including command parsing



L .	limestamp (n:m:s.ms.us.ns dur)	nost	DeAlce	seq. rc.	1 mescamp	nost	Device LC	
35046	11:29:31.586.787.079 170.1	Start of Burst			237 2.824.603.474 803.56us	QREQ(READ FLAG)		CMD (START STOP UNIT)
3504'	11:29:31.586.787.086 6.66ns	Filler(2x)			238 2.824.803.614 200.13us		QRESP(READ FLAG) (Su	7 6 5 4 3 2 107 6 5 4 3 2 107 6 5 4 3 2 107 6 5 4 3 2 10
35048	11:29:31.586.792.809 5.72us	AFC TC0 CReq=0		06	239 2.825.610.440 806.82us	QREQ(READ FLAG)		
35049	11:29:31.586.798.598 5.78us	Filler(2x)			240 2.825.816.500 206.05us		QRESP(READ FLAG) (Su	
35050	11:29:31.586.804.347 5.74us	AFC TC0 CReq=0		06	241 2.826.617.393 800.89us	QREQ(READ FLAG)		
3505	11:29:31.586.810.097 5.74us	Filler(2x)			242 2.826.817.846 200.45us		QRESP(READ FLAG) (Su	IID mand Set Reserved Reserved Reserved
3505	11:29:31.586.815.833 5.73us	AFC TC0 CReq=0		06	243 2.827.624.342 806.49us	QREQ(READ FLAG)		4 ON OUN OUN OUN
3505:	11:29:31.586.821.609 5.77us	Filler(2x)			244 2.827.830.785 206.44us		QRESP(READ FLAG) (Su	EHS Length Reserved Data Segment Length
3505	11:29:31.586.827.315 5.70us	Data Frame TCO			245 2.828.631.308 800.52us	QREQ(READ FLAG)		8 00h 00h 0000h
3505	11:29:31.586.879.120 51.80	EOF EVEN		17	246 2.828.832.105 200.79us		QRESP(READ FLAG) (Su	Data Transfer Leng Data Transfer Lengt Data Transfer Lengd Data Transfer Len
35050	11:29:31.586.884.876 5.75us	End of Burst			247 2.829.638.301 806.19us	QREQ(READ FLAG)		1200h_00h_00h00h_00h00h
3505	11:29:31.586.884.883 6.66ns	Filler(2x)			248 2.829.845.100 206.79us		QRESP(READ FLAG) (Su	OPERATION CODE Reserved ME Reserved ONDITION
3505	11:29:31.586.998.931 114.0		PREPARE		249 2.830.645.253 800.15us	QREQ(READ FLAG)		16 1Bh 00h 0 X00h 0h
35059	11:29:31.587.027.862 28.93		Start of Burst		250 2.830.846.393 201.13us		QRESP(READ FLAG) (Su	R CONDITIENT CONTROL Reserved Reserved
35060	11:29:31.587.027.868 6.66ns		Filler(4x)		251 2.831.652.216 805.82us	QREQ(READ FLAG)		20 1h 0 0 00h 00h 00h
3506;	11:29:31.587.032.528 4.65us		AFC TC0 CReq=0	17	252 2.831.859.332 207.11us		QRESP(READ FLAG) (Su	
3506;	11:29:31.587.041.770 9.24us		Data Frame TCO		253 2.832.659.235 799.90us	CMD (TEST UNIT READY)	D	
3506;	11:29:31.587.051.283 9.51us	STALL			254 2.832.860.692 201.45us		RESPONSE D	
3506	11:29:31.587.106.624 55.34		EOF EVEN	07	255 2.833.240.377 379.68us	QREQ(READ DESCRIPTOR)		
3506	11:29:31.587.111.270 4.64us		Data Frame TCO		256 2.833.450.076 209.69us		QRESP(READ DESCRIPTO	
35060	11:29:31.587.152.959 41.68		EOF EVEN	08	257 2.833.827.315 377.23us	CMD (REQUEST SENSE)	D	
3506'	11:29:31.587.157.592 4.63us		Filler(4x)		258 2.834.041.770 214.45us		REQUEST_SENSE_RESPON D	1 (CID Files Pite 0
35068	11:29:31.587.175.584 17.99	PREPARE			259 2.834.111.270 69.49us		RESPONSE D	I [0]K Flag Bit= 0
35069	11:29:31.587.208.560 32.97		End of Burst		260 2.834.428.705 317.43us	CMD (START STOP UNIT)	D	[2]CP= 0
35070	11:29:31.587.208.567 6.66ns		Filler(2x)		261 2.834.645.047 216.34us		RESPONSE D	[1:0]ATTR= Simple (0h)
3507:	11:29:31.587.244.577 36.00		STALL		262 2.835.441.380 796.33us	CMD (INQUIRY)	D	3 [7:0]Task Tag= 18h
3507:	11:29:31.587.371.111 126.5	Start of Burst			263 2.835.647.220 205.83us		INQUIRY_RESPONSE D	4 [7:4]IID= 0
3507:	11:29:31.587.371.117 6.66ns	Filler(2x)			264 2.835.744.483 97.26us		RESPONSE D	[3:0]Command Set Type= SCSI Command Set (SPC, SBC) (0h) 8 [7:0]EHS Length= 00h
35074	11:29:31.587.376.897 5.77us	AFC TC0 CReq=0		07	265 2.836.062.902 318.41us	QREQ(READ DESCRIPTOR)		10 [15:0]Data Segment Length= 0000h
3507	11:29:31.587.382.630 5.73us	Filler(2x)			266 2.836.276.064 213.16us		QRESP(READ DESCRIPTO	12 [31:0]Expected Data Transfer Length= 00000000h
35076	11:29:31.587.388.379 5.74us	AFC TC0 CReq=0		07	267 2.836.810.970 534.90us	QREQ(READ ATTRIBUTE)		16 [7:0]OPERATION CODE= START STOP UNIT (1Bh) 17 [01TMMED= 0b
3507	11:29:31.587.394.142 5.76us	Filler(2x)			268 2.837.023.105 212.13us		QRESP(READ ATTRIBUTE	19 (3:0) POWER CONDITION MODIFIER== 0h
35078	11:29:31.587.399.918 5.77us	AFC TC0 CReg=0		07	269 2.837.829.438 806.33us	QREQ(READ ATTRIBUTE)		[3:0] POWER CONDITION MODIFIER= 0h
35075	11:29:31.587.405.654 5.73us	Filler(2x)			270 2.838.034.361 204.92us		QRESP (READ ATTRIBUTE	20 [/:4]FUNEK CONDITION= IN [2]NO FLUSH= 0h
35080	11:29:31.587.411.403 5.74us	AFC TC0 CReg=0		08	271 2.838.836.431 802.06us	QREQ(READ DESCRIPTOR)		[1]LOEJ= 0h
3508:	11:29:31.587.417.166 5.76us	Filler(2x)			272 2.839.038.024 201.59us		QRESP(READ DESCRIPTO	[0]START= 0h
35082	11:29:31.587.422.942 5.77us	AFC TC0 CReq=0		08	273 2.839.486.686 448.66us	CMD (TEST UNIT READY)	0	21 [/:0]COMINGE OON
3508.	11:29:31.587.428.705 5.76us	Data Frame TCO			274 2.839.694.728 208.04us		RESPONSE 0	
35084	11:29:31.587.480.510 51.80	EOF EVEN		18	275 2.841.782.943 2.08ms	CMD (REQUEST SENSE)	0	0 1 2 3 4 5 6 7 ASCII
3508.	11:29:31.587.486.266 5.75us	Filler(2x)			276 2.841.788.047 5.10us		REQUEST_SENSE_RESPON 0	
3508	11:29:31.587.492.002 5.73us	End of Burst			277 2.841.788.767 719.92ns		RESPONSE 0	10h 1B 00 00 00 10 00 00
3508	11:29:31.587.492.009 6.66ns	Filler(2x)			278 2.841.823.555 34.78us	QREQ(READ DESCRIPTOR)		18h 00 00 00 00 00 00 00 00
3508	11:29:31.587.603.491 111.4		PREPARE		279 2.841.829.351 5.79us		QRESP(READ DESCRIPTO	
<u> </u>			10. · · · ·					Detsil Navizator Hide Items

Unipro

UFS

Detail



- 4. Use 32Gb RAM as the buffer to stream all M-PHY data into the SSD HD in order to record all data flow from PWM Mode to High Speed Mode.
- 5. "Data Filter" filters unwanted data to save memory.
- 6. "Search" searches specific data.
- 7. "CRC Packet" displays and counts CRC
- 8. Unipro / UFS command statistics include numbers of packets, individual command, different data length, and errors

Navigator			0 🗙	Navigator			6 X
Discription	Txns	Bytes		Discription	Txns	Bytes	
Unipro ✓ Unipro ✓ Unipro ✓ L2 SOF AFC TC0 AFC TC0 COF TC0 EOF EVEN EOF ODD ↓ L1.5 ✓ L1 HIBERN8 STALL SLEEP LINE RESET LINE RESET LINE CONFIG PREPARE ▶ Error Packets	83257 8318 66591 8 0 22 8318 0 222 8318 0 1252 310 2 135 19 0 0 0 154 13	pyres		✓ UFS SCSI Command UFS Protocol QUERY REQUEST QUERY RESPONSE TASK MANAGEMENT LUN TRANSFER LENGTH RESERVED	148 655 34 34 0 799 129	Dytes	
			8				8
Statistics		Type	Puter	Statistics		Type	Putor
✓ AFC TC0 Host Device		66591 66311 280		NOP OUT NOP IN RESPONSE READ(10) DATA(DATA IN) REQUEST SENSE RESPO INQUIRY RESPONSE DAT/	INSE DATA(DATA A(DATA IN)	2 2 147 496 (IN) 7 1	
Detail Navigator Hide Items				Detail Navigator Hide Items			
Unip	ro			l	JFS		



9. Command trigger

- a. Trigger parameters include commands and data in order to cover all kinds of packets.
- b. CRC Error, Unknown packet
- c. VCC drop, VCCQ2 drop
- d. The Trigger-Out port is to trigger a DSO to capture waveforms

✓ Trigger On		
	Trigger Item 1/8	Clear All
Unknown Packet	CRC ERR	
VCC Drop	VCCQ2 Drop	

	READ (6)								
	7 6 5	4 3 2	1 0	76	5	4 3	2	1 0	
	HD DD	Transaction Cod	e	Reserved R Flag Bi	it W Flag Bit	Reserved	CP	ATTR	
0		01h			X	Xh	X	Xh	
		LUN				Task Tag			
2		xxn	10.17	l		XXn			
	IID	Comm	and Set Type			Reserved			
4			All	l		7411			
6			XX	(Xh					
ľ		EHS Length	,,,,,			Reserved			
8		XXh				XXh			
			Data Segn	nent Length					
10			XX	(Xh					
	Expected Data Transfer Length								
12			XX	(Xh					
	Expected Data Transfer Length								
14	XXXXh								
	OPERATION CODE Reserved LOGICAL BLOCK ADDRESS								
	OP	ERATION CODE		Reserve	d	LOG	SICAL BLOCK A	DDRESS	
16	OP	ERATION CODE 08h		Reserver Xh	d	LOG	SICAL BLOCK A XXh	ADDRESS	
16	OP	ERATION CODE 08h	LOGICAL BLO	Reserved Xh OCK ADDRESS	đ	LOG	SICAL BLOCK A XXh	ADDRESS	
16 18	0P	ERATION CODE 08h	LOGICAL BLC XX	Reserved Xh CKADDRESS Xh	d	LOG	SICAL BLOCK A XXh	ADDRESS	
16 18		ERATION CODE 08h WSFER LENGTH	LOGICAL BLC XX	CK ADDRESS	1		SICAL BLOCK A XXh	ADDRESS	
16 18 20		ERATION CODE 08h NSFER LENGTH XXh	LOGICAL BLC XXX	Reserved		CONTROL	SICAL BLOCK A XXh		
16 18 20		ERATION CODE 08h NSFER LENGTH XXh	LOGICAL BLC XXX Res	Reserved		CONTROL	SICAL BLOCK A XXh		
16 18 20 22		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res	CK ADDRESS CK ADDRESS CXh erved CXh	3	CONTROL	SICAL BLOCK A XXh		
16 18 20 22 24		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX	CK ADDRESS CKADDRESS CKADR		CONTROL XXh	SICAL BLOCK A XXh		
16 18 20 22 24		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX Res	CK ADDRESS CK ADDRESS CKh erved CKh erved CKh erved CKh	j 	CONTROL XXh	SICAL BLOCK A XXh		
16 18 20 22 24 26		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX Res XXX	CK ADDRESS CKADDRESS CKADDRESS CKADDRESS CKADCRESS CKADCRES CKADCRE	j	CONTROL	JICAL BLOCK A XXh		
16 18 20 22 24 26		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX Res XXX Res XXX Res	CK ADDRESS CKADDRESS CKADDRESS CKADDRESS CKADCRESS CKADCRES C	3	CONTROL XXh	JICAL BLOCK A XXh		
16 18 20 22 24 26 28		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX Res XXX Res XXX Res XXX	Reserved Xh CCK ADDRESS CXh erved CXh		CONTROL	JICAL BLOCK A XXh		
16 18 20 22 24 26 28		ERATION CODE 08h INISFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX Res XXX Res XXX Res	Reserver Xh ICK ADDRESS Xh ICK ADDRESS Xh Intervention Intervention Xh Intervention Xh Intervention Xh Xh Xh Xh Intervention Xh Xh <td< th=""><th></th><th>CONTROL XXh</th><th>ICAL BLOCK A XXh</th><th></th></td<>		CONTROL XXh	ICAL BLOCK A XXh		
16 18 20 22 24 26 28 30		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX Res XXX Res XXX Res XXX XXX XXX XXX XXX XXX	Reserver Xh ICK ADDRESS XM Image: Second Seco		CONTROL XXh	ICAL BLOCK A XXh		
16 18 20 22 24 26 28 30		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX Res XXX Res XXX Res XXX XXX	CK ADDRESS CKh CK ADDRESS CKh erved		CONTROL XXh	ICAL BLOCK A XXh		
16 18 20 22 24 26 28 30		ERATION CODE 08h INSFER LENGTH XXh	LOGICAL BLC XXX Res XXX Res XXX Res XXX Res XXX Res XXX	CK ADDRESS CXh CK ADDRESS CXh enved		CONTROL XXh	ICAL BLOCK A XXh		



9. Advanced usage of the report area

a. Dual report correlation: Unipro and UFS reports are related to each other.

Double-click to track the corresponding data in another report area.

ex: Click the Unipro area report to link to the UFS corresponding report.

	(instance (instance and a control of the control of	nosc	Device			1 Twes camp	1080	Device	TASK TAY	Data
1280	16:15:03.796.342.673 13.33	Filler(2x)			2					
1281	16:15:03.796.342.703 29.99	AFC TC0 CReq=0			3	16:15:03.783.717.515 0 (Ma	NOP OUT		00	00 00 00 0
1282	16:15:03.796.342.729 26.66	Filler(2x)		1	4	16:15:03.783.938.943 221.4		NOP IN	00	20 00 00 00
1283	16:15:03.796.342.756 26.66	AFC TCO CReg=0			5	16:15:03.792.935.487 8.99ms	CMD (TEST UNIT READY)		01	01 00 B0 0
1284	16:15:03.796.342.783 26.66	Filler(2x)		. 11	6	16:15:03.792.940.406 4.91us		RESPONSE	01	21 00 B0 0
1285	16:15:03.796.342.813 29.99	AFC TCO CReg=0			7	16:15:03.793.956.611 1.01ms	CMD (TEST UNIT READY)		02	01 00 B0 0:
1286	16:15:03.796.342.839 26.66	AFC TC0 CReg=0			8	16:15:03.793.960.981 4.36us		RESPONSE	02	21 00 B0 0:
1287	16:15:03.796.342.893 53.32	AFC TC0 CReg=0			9	16:15:03.793.985.555 24.57	CMD (READ (10))		03	01 40 B0 0
1288	16:15:03.796.342.906 13.33		EOF EVEN		10	16:15:03.794.209.246 223.6		DATA IN	03	22 00 B0 0:
1289	16:15:03.796.342.919 13.33	AFC TC0 CReg=0			11	16:15:03.794.238.410 29.16		RESPONSE	03	21 00 B0 0:
1290	16:15:03.796.342.933 13.33		Filler(6x)		12	16:15:03.794.310.372 71.96	CMD (READ (10))		04	01 40 B0 0
1291	16:15:03.796.342.976 43.32	Filler(4x)			13	16:15:03.794.372.383 62.01		DATA IN	04	22 00 B0 0
1292	16:15:03.796.343.029 53.32	AFC TC0 CReq=0			14	16:15:03.794.401.543 29.16		RESPONSE	04	21 00 B0 04
1293	16:15:03.796.343.056 26.66	Filler(2x)		1	15	16:15:03.796.251.568 1.85ms	CMD (READ (10))		05	01 40 B0 0
1294	16:15:03.796.343.086 29.99	AFC TC0 CReq=0			16	16:15:03.796.313.495 61.92		DATA IN	05	22 00 B0 0
1295	16:15:03.796.343.112 26.66	Filler(6x)		1	17	16:15:03.796.342.659 29.16		RESPONSE	05	21 00 B0 0
1296	16:15:03.796.343.306 193.3	AFC TC0 CReq=0			18	16:15:03.796.362.107 19.44	CMD (READ (10))		06	01 40 B0 00
1297	16:15:03.796.343.332 26.66	Filler(2x)			19	16:15:03.796.424.391 62.28		DATA IN	06	22 00 B0 0(
1298	16:15:03.796.343.359 26.66	AFC TCO CReg=0			20	16:15:03.796.453.551 29.16		RESPONSE	06	21 00 B0 0
1299	16:15:03.796.343.386 26.66	Filler(2x)			21	16:15:03.796.491.171 37.61	CMD (READ (10))		07	01 40 B0 0'
1300	16:15:03.796.343.412 26.66	AFC TCO CReg=0			22	16:15:03.796.553.098 61.92		DATA IN	07	22 00 B0 0'
1301	16:15:03.796.343.442 29.99	Filler(6x)			23	16:15:03.796.582.262 29.16		RESPONSE	07	21 00 B0 0'
1302	16:15:03.796.362.107 18.66	Data Frame TCO			24	16:15:03.796.592.558 10.29	CMD (READ (10))		08	01 40 B0 0
1303	16:15:03.796.362.354 246.6	EOF EVEN			25	16:15:03.796.655.115 62.55		DATA IN	08	22 00 B0 01
1304	16:15:03.796.362.381 26.66	Filler(4x)			26	16:15:03.796.684.275 29.16		RESPONSE	08	21 00 B0 01
1305	16:15:03.796.363.270 889.9		AFC TCO CReq=0		27	16:15:03.797.375.309 691.0	CMD (READ (10))		09	01 40 B0 01
1306	16:15:03.796.363.324 53.32		Filler(6x)		28	16:15:03.797.450.942 75.63		DATA IN	09	22 00 B0 01
1307	16:15:03.796.363.350 26.66		AFC TCO CReq=0		29	16:15:03.797.480.105 29.16		DATA IN	09	22 00 B0 01
1308	16:15:03.796.363.407 56.66		Filler(4x)		30	16:15:03.797.509.266 29.16		DATA IN	09	22 00 B0 01
1309	16:15:03.796.424.391 60.98		Data Frame TCO		31	16:15:03.797.538.430 29.16		DATA IN	09	22 00 B0 0
1310	16:15:03.796.426.281 1.88us		EOF EVEN		32	16:15:03.797.567.593 29.16		DATA IN	09	22 00 B0 0
1311	16:15:03.796.426.307 26.66		Data Frame TCO		33	16:15:03.797.596.754 29.16		DATA IN	09	22 00 B0 0
1312	16:15:03.796.426.681 373.2	AFC TCO CReg=0			34	16:15:03.797.625.918 29.16		DATA IN	09	22 00 B0 0
1313	16:15:03.796.426.707 26.66	Filler(2x)		. 11	35	16:15:03.797.655.081 29.16		DATA IN	09	22 00 B0 0
1314	16:15:03.796.426.734 26.66	AFC TC0 CReg=0			36	16:15:03.797.684.242 29.16		DATA IN	09	22 00 B0 0
1315	16:15:03.796.426.764 29.99	Filler(2x)			37	16:15:03.797.713.405 29.16		DATA IN	09	22 00 B0 0
1316	16:15:03.796.426.791 26.66	AFC TC0 CReg=0			38	16:15:03.797.742.566 29.16		DATA IN	09	22 00 B0 0
1317	16:15:03.796.426.817 26.66	Filler(2x)			39	16:15:03.797.771.730 29.16		DATA IN	09	22 00 B0 0
1318	16:15:03.796.426.844 26.66	AFC TC0 CReg=0			40	16:15:03.797.800.893 29.16		DATA IN	09	22 00 B0 0
1319	16:15:03.796.426.871 26.66	AFC TCO CReg=0			41	16:15:03.797.830.054 29.16		DATA IN	09	22 00 B0 0
1320	16:15:03.796.426.927 56.66	AFC TCO CReg=0			42	16:15:03.797.859.218 29.16		DATA IN	09	22 00 B0 0
1321	16:15:03.796.426.954 26.66	AFC TCO CReq=0			43	16:15:03.797.888.381 29.16		DATA IN	09	22 00 B0 0
1322		E1114*(4v)			44	16:15:03.797.917.542 29.16		DATA IN	09	22 00 B0 0
	16:15:03.796.427.011 56.66	111101(18)								
1323	16:15:03.796.427.011 56.66 16:15:03.796.428.201 1.18us		EOF EVEN	$\overline{\mathbf{v}}$	45	16:15:03.797.946.705 29.16		DATA IN	09	22 00 B0 0

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

Pile Capture	Cursor								C	•		
PR.	AND	Se:	rch All Field				Inon t	h۵	Statict	ICC		t
1	Bus 🛸 👘		21	5 / 872	▼ ► SM				່ວເລເເວເ	ICS	LIS	ι
Connect F	rotocol Protocol Analyzer No Support Wavefor	rms Run ^{Se}	arch 🔨 🔨 🗖	То	bottom Window Save to text	EXTDSO						
					Report List				Mardantes			0.9
Timest	amp (h:m:s.ms.us.ns dur) Host	Dev	ice 🔳	Timestam	Show Both Report		Device	LUN 🛎	Navigator			80
35300	11:29:31.594.782.943 6.66ng Data F	rame TCO	25	8 2	2.834.0 Chaw Lie Bro Bason		REQUEST SENSE RESPON.	DO	Usenption VIES	Txns	Bytes	
35301	11:29:31.594.782.952 8.88ns Filler	(2x)	25	9 2	310W OHPTO Report		RESPONSE	DO	SCSI Command	148		
35302	11:29:31.594.783.003 51.11 EOF EV	EN	26	0 2	Show UFS Report	RT STOP UNIT		DO	UFS Protocol	655		
35303	11+29+31-594-783-009 6-6658 Filler	(4%)	26	1 2	2.834.645.047 216.341		DESDONSE	DO	QUERY REQUEST	34		
35304	11:29:31.594.783.324 314.4_	Fil	ler(4x) 26	2 2	1.835.441.380 796.3348	CMD (INQUIRY)		DO	QUERY RESPONSE TASK MANAGEMENT	34		
35305	11:29:31.594.783.326 2.21ns	AFC	TCO CRegeo 26	3 2	1.835.647.220 205.10us		INCUIRY RESPONSE	DO	LUN	799		
35306	11:29:31.594.783.337 11.11	AFC	TCO CReg=0 26	4 2	2.835.744.483 97.16us		RESPONSE	DO	TRANSFER LENGTH	129		
35307	11:29:31.594.783.359 22.21.	Fil	ler(6x) 26	5 2	1.836.062.902 31.41us	OREQ (READ DESCRIPTOR)		RESERVED			
35308	11:29:31.594.788.047 4.68us	Dat	a Frame TCO 26	6 2	2.836.276.064 2 3.16us		QRESP (READ DESCRIPTO.					
35309	11:29:31.594.788.140 93.32.	EOF	EVEN 26	7 2	2.836.810.970 34.90us	QREQ(READ ATTRIBUTE)						
35310	11:29:31.594.788.147 6.66ns	Fil	ler(4x) 26	8 2	2.837.023.105 212.13us		ORESP (READ ATTRIBUTE.					
35311	11:29:31.594.788.239 92.22_ AFC TC	0 CReg=0	26	9 2	1.837.829.43 806.33us	QREQ(READ ATTRIBUTE)						M
35312	11:29:31.594.788.252 13.33 AFC TC	0 CReg=0	27	0 2	2.838.034.361 204.92us		QRESP (READ ATTRIBUTE.					
35313	11:29:31.594.788.261 8.88ns Filler	(2x)	27	1 2	1.838.836 431 802.06us	QREQ(READ DESCRIPTOR)		Statistics		Txns	Bytes
35314	11:29:31.594.788.266 4.45ns AFC TC	0 CReq=0	27	2 2	1.839.031.024 201.59us		QRESP(READ DESCRIPTO.		CMD (TEST UNIT READY)		10	
35315	11:29:31.594.788.274 8.88ns Filler	(2x)	27	3 2	2.839.416.686 448.66us	CMD (TEST UNIT READY)	00	CMD (READ (10))		129	
35316	11:29:31.594.788.288 13.33. Filler	(6x)	27	4 2	1.839. 94.728 208.04us		RESPONSE	00	CMD (START STOP UNIT)	_	1	
35317	11:29:31.594.788.767 478.8	Dat	a Frame TCO 27	5 2	2.841 782.943 2.08ms	CMD (REQUEST SENSE)		00	CMD (INQUIRY)		1	
35318	11:29:31.594.788.827 59.99	EOF	EVEN 27	6 2	2.84 .788.047 5.10us		REQUEST_SENSE_RESPON.	. 00				
35319	11:29:31.594.788.833 6.66ns	Fil	ler(6x) 27	7 2	2.811.788.767 719.92ns		RESPONSE	00				
35320	11:29:31.594.788.919 85.55 AFC TC	0 CReg=0	27	8 2	2.041.823.555 34.78us	QREQ(READ DESCRIPTOR)					
35321	11:29:31.594.788.939 19.99. AFC TC	0 CReg=0	27	9	.841.829.351 5.79us		QRESP(READ DESCRIPTO.					
35322	11:29:31.594.788.941 2.21ns Filler	(6x)	28	0	.841.867.511 38.15us	QREQ(READ DESCRIPTOR)					
35323	11:29:31.594.788.961 19.99 Filler	(6x)	28	1 2	2.841.872.424 4.91us		QRESP(READ DESCRIPTO.					
35324	11:29:31.594.823.555 34.59 Data F	rame TCO	28	2 2	.841.962.178 89.75us	CMD (READ (10))		00				
35325	11:29:31.594.823.615 59.99. EOF EV	EN	- 28	3 2	2.842.217.430 255.25us		READ	00				
1			2 🗌 🗉					- E	Detail Navigator Hide Items			
_									and the second second			_
each List [UniPro]	Search List [URS] Trigger List Statistics List	Bookmark List [UniPro] Book	nark Lint [URS]									
Statistics List												(B)×
₩ ⊼ ^	2 17 🗸 🖌 🖬 🖬 🖬 🔛											
Line No.	Timentamp	Host	Device	LUN	Task Tag (Data Segment Lens, G	gical Block Add TL (Transfer Length)	Deta.					
257	2.833.827.315 0	CMD (REQUEST SENSE)		D0 17	0000		01 40 D0 1					
275	2.841.782.943 7.95ms	CMD (REQUEST SENSE)		00 15	0000		01 40 00 1					
293	2.843.338.161 1.55ms	CMD (REQUEST SENSE)		01 26	0000		01 40 01 2					
311	2.844.730.048 1.39ms	CMD (REQUEST SENSE)		02 20	0000		01 40 02 2					
329	2.846.088.925 1.35ms	CMD (REQUEST SENSE)		03 34	0000		01 40 03 3					-
347	2.847.449.333 1.3€ms	CMD (REQUEST SENSE)		04 3B	0000		01 40 04 3					



-				0			1-		1-	in sec.	Navigator				
Tin	estamp (himis.ms.us.ns dur) Host	Devio	•	Time	estamp		Host		Device	LON	Discription		Txns	Bytes	
	11:29:31.594.240.624 52.21	Start	of Burst	258	2.834.041	.770 214.45us			REQUEST_SENSE	RESPON. DO	▼ UFS				
	11-12-01-024-1240-003-10-04	11116	r (0x)	259	2,834,111.	.270 69.49us			RESPONSE	DO	SCSI Comm	and	148		
	11:29:31.594.782.936 542.2 Start of Burst			260	2.834.428	.705 317.43us	CMD (ST)	ART STOP UNIT)		DO	OLIERY REC	A	34		
	11:29:31.594.782.943 6.66ns Data Frame TCO			261	2.834.645.	.047 216.34us			RESPONSE	DO	QUERY RES	SPONSE	34		
	11:29:31.594.782.952 8.88ns Filler(2x)			262	2.835.441	.380 796.33us	CMD (IN	QUIRY)		DO	TASK MANA	GEMENT	0		
	11:29:31.594.783.003 51.11. EOF EVEN			263	2.835.647.	.220 205.83us			INQUIRY_RESPON	ISE DO	LUN		799		
	11:29:31.594.783.009 6.66ns Filler(4x)			264	2.835.744	483 97.26us			RESPONSE	DO	RESERVED	IGIH	129		
	11:29:31.594.783.324 314.4	Fille	r (4x)	265	2.836.062	.902 318.41us	QREQ (RE	D DESCRIPTOR)			RECERVED		_		_
	11:29:31.594.783.326 2.21ns	AFC T	CO CReg=0	266	2.836.276.	.064 213.16us			QRESP (READ DES	SCRIPTO					
	11:29:31.594.783.337 11.11	AFC T	CO CReg=0	267	2.836.810.	.970 534.90us	QREQ (RE	D ATTRIBUTE)			1				
	11:29:31.594.783.359 22.21	Fille	r (6x)	268	2.837.023	105 212.13us			QRESP (READ ATT	TRIBUTE					
	11:29:31.594.788.047 4.68us	Data	Frame TCO	269	2.837.829.	438 806.33us	QREQ (REJ	D ATTRIBUTE)							
	11:29:31.594.788.140 93.32	EOF E	VEN	270	2.838.034	.361 204.92us			QRESP (READ ATT	TRIBUTE					
	11:29:31.594.788.147 6.66ns	Fille	r (4x)	271	2.838.836.	431 802.06us	QREQ (REL	D DESCRIPTOR)							
	11:29:31.594.788.239 92.22 AFC TCO CReq=0			272	2,839,038	024 201.5915			ORESP (READ DE)	SCRIPTO			_		
	11:29:31.594.788.252 13.33 AFC TCO CReq=0			273	2.839.486.	686 448.66us	CMD (TE:	ST UNIT READY)		00	Statistics			Typs	Buter
	11:29:31.594.788.261 8.88ns Filler(2x)			274	2.839.694	728 208.04us			RESPONSE	00	CMD (TEST UNI	T READY)	_	10	
	11:29:31.594.788.266 4.45ns AFC TCO CReq=0			275	2.841.782.	.943 2.08ms	CMD (RE)	UEST SENSE)		00	CMD (READ (10	J))		129	
	11:29:31.594.788.274 8.88ns Filler(2x)			276	2.841.788.	.047 5.10us			REQUEST_SENSE	RESPON 00	CMD (REQUES	TSENSE)		7	
	11:29:31.594.788.288 13.33 Filler(6x)			100	0.041 000	3/3 310 03mm			DECRONCE		CMD (START ST	OP UNIT)		1	
	11:29:31.594.788.767 478.8	Data	Frame TCO	278	2.841.823.	555 34.78us	QREQ (REJ	DESCRIPTOR)			CIMD (Integration)				
	11:29:31.594.788.827 59.99	EOF E	VEN	219	2.841.829.	.351 5.79us			QRESP (READ DES	SCRIPTO					
_	11:29:31.594.788.833 6.66ns	Fille	r (6x)	290	2.841.867.	511 38.15us	QREQ (REJ	D DESCRIPTOR)							
	11:29:31.594.788.919 85.55 AFC TCO CReg=0			281	2.841.872.	424 4.91us			QRESP (READ DES	SCRIPTO					
	11:29:31.594.788.939 19.99. AFC TC0 CReg=0			282	2.841.962	178 89.75us	CMD (REJ	AD (10))		00					
	11:29:31.594.788.941 2.21ns Filler(6x)			283	2.842.217	430 255.25us			READ	00					
	11:29:31.594.788.961 19.99. Filler(6x)			284	2.842.224	.723 7.29us			RESPONSE	00					
	11:29:31.594.823.555 34.59 Data Frame TCO			285	2.842.270	.017 45.29us	CMD (RE	AD (10))		00					
	11:29:31.594.823.615 59.99. EOF EVEN			296	2.842.375	.741 105.72us			READ	00					
	11:29:31.594.823.622 6.66ns Filler(4x)			287	2.842.383	.034 7.29us			RESPONSE	00					
-	11:29:31.594.823.943 321.0	Fille	r (6x)	298	2,842,448	.363 65.32us	CMD (RE)	D (10))		00					
									1		Datel Maniator	Hide Items			
											source wavigant	LINE I FOR			
ist [Un	iPro] Search List [URS] Trigger List Statistics List Bookmark List	UmPro] Bookman	k Lint [URS]	- I.											
s List	1														
^															
os No	Timethma	lost	Tauize	LIDI	Task Tag	(Data Segment Lang)	Logical Block and	TL (Travefer Length)	Data						
2	2,833,827,315,0 CMD (PEOLE	ST SENSEL	LATER	00	17	0000	organic procession	Contraction of the second	1 40 00 1						_
5	2.841.782.943.7.95ma CMD (REQUE	ST SENSE)		00	18	0000			1 40 00 1						
3	2 843 338 161 1 55mm (MD (RECIT	ST SENSEL		01	26	0000			1 40 01 2						
1	2.844.730.048 1.35ms CND (REQUE	ST SENSE)		0.2	20	0000			1 40 02 2						
- 0	2 846 088 925 1 35mm CMD (REQUE	CT CENCEI		03	14	0000			1 40 03 3						
2	2 847 448 333 1 2/mm (MD (REQUE	er ermert		0.4	38	0000			1 40 04 3	/					
	CRD (REQUE	(A (BARAE)		04	30	0000				-					_

The process of tracing from UFS statistic data to Unipro original data



10. UFS Settings

Protocol Settings						×			
eMMC 5.1 MIPI CSI			Startup 5						
MIPI DSI NAND Flash	UFS Fixture		Mode	PWM	Reference Clock				
MIPI RFFE RS232		•	Lane	1 Lane	19.2MHz	-			
SD 3.0			Gear	PWM-Gear1					
SGMI	UFS Probe Settings 2		Trigger Or	6					
UFS					Trigger Item 0/	8 Clear All			
UFS	UFS-tip Settings	Active UFS M-PHY Way Station Non RefClk	♥ UFS Pa ♥ Any ♥ SCS						
	• tip	Show Volt. Detect Ch	Unknow	m Packet	CRC Error				
		VCC(A0)		A0) Drop					
		VCCQ2(A1)		Q2(A1) Drop					
	Detail Report Display 🕢		Filter 🔽						
	 Table + Text 	○ Table only	Data Fil	ter > 256	Uptes				
	O Default				✓ ОК	× Cancel			

- 1. **Connection:** You need to select the connection method between BusFinder and the test object
- 2. **UFS Probe Settings:** Exchange p/n of the same Lane. RefClk Option can observe whether RefClk is operating..
- 3. UFS-tip Settings:
 - a. To enable the UFS Reset pin option, you need to connect the reset pin to the UFS-tip CH4 position of the UFS Probe. When the protocol analysis receives the Reset signal, it will reset the Power mode and return to the PWM mode.
 - b. After the Show Volt. Detect Ch is turned on, the detected voltage value will be displayed when the voltage changes
- 4. **Detail Report Display:** Add the detail report by using text description.
- 5. **Startup:** It needs to be set the mode of the DUT at the moment of capturing data and Reference clock(19.2 / 26 / 38.4 / 52 MHz). (It doesn't matter if the RefClk is not connected, but its frequency must be set)
- 6. **Trigger On:** can set Unipro / UFS packets, a total of 8 groups, and Unknown Packet, CRC Error trigger options, another two sets of voltage detection can be used,
- 7. **Filter:** After opening, it will filter out the data behind the packet greater than the set value



FAQ

1. What UFS version is supported, any limitation for differential ports?

A:MIPI M-PHY 3.0, Up to 5.8Gbps (Gear 3, Rate A / B), 2 Lanes MIPI Unipro 1.8 JEDEC UFS 2.1 JEDEC UFS 3.1 commands

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 SMPM Coaxial Cable connection 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

a. Wiring problem:

Please make sure to connection according to the "Probe and test object connection" on page 10. If the PWM is normal during measurement, but you cannot see any HS data or you can only go to 1 Lane and not 2 Lane, you should first check whether the wiring is wrong.

b. Reference clock setting method:

There are four options for Ref CLK 19.2MHz (default) / 26MHz / 38.4MHz / 52MHz in Settings. If it is not clear what the Ref CLK is used, refer to the following method. If the PWM is normal but the HS Data is wrong, please try to adjust the Ref CLK to others and try again.

5. Can I specify a Unipro, UFS packet as the trigger point function?

A: You can specify specific Unipro, UFS packet or Error to trigger.





6. Is it possible to set a Unipro, UFS 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

a. Connect using UFS Fixture (connector)

If the Host has multiple sets of connectors, it is convenient to replace the Host and UFS Chip, and directly use the SMPM Cable to connect to the Way Station without jumpers.

Since the connector uses a flexible cable to extend the signal, it is only suitable for applications where the peripheral components of the UFS Chip do not interfere.

Components	
1. Con Fixture	
2. Con Dummy Board	0.3mm tin balls need to be planted on the back
3. Connector DF17-30DS-0.5V (HiRose Connector)	

<u>Step1:</u> Remove the UFS chip on your DUT, and then rebuild the solder ball on UFS chip. <u>Step2:</u> Welding the connector to the position where the UFS Chip has been removed.



(Pay attention to the direction of Pin1 when welding the connector.)



<u>Step3:</u> Place the connector (DF17-30DS-0.5V) on the small board of the connector. Before welding, please pay attention to the mistake proofing between the connector and the board.



<u>Step4:</u> After the welding is completed, confirm whether there is a short circuit between the pins. Pin defined is shown as below,





<u>Step5:</u> Connect the Con Fixture, please pay attention to the mistake proofing between the board and the Fixture.



<u>Step6:</u> Put the unplugged UFS Chip into the Con Fixture UFS Socket (FBGA153 Socket), and finish.

b. Use Interposer with End-tip connection

If the components around the original UFS Chip interfere, UFS Fixture cannot be used and there is no test point around the UFS Chip can jumper on, you need to remove the UFS Chip and reball the interposer on the board, and then reball the UFS chip again. Connect End- from the test point. use the SMPM cable to connect to the Way Station.

If there are test points left on the board to be tested, they can be used directly

Components								
Interposer	Front	Back						
End-tip (FPC)		End-tip Connector (FPC)						



Combined



(Interposer Pin Define)

C. Connect using End-tip

If the board has a test point that can be jumpered, it can be used directly. After the End-tip is connected to the test, there is no need to use a booster board.

The UFS standard terminal soft board resistance is 2500hm, which can be used directly under normal circumstances.



If you want to shorten the jumper distance to improve signal quality, you can use the following resistance bridge method.

To use the resistance bridging method without jumpers (as shown in the figure below), the End-tip needs to be modified.

Modification process:

<u>Step1:</u> Remove the resistor, cut off the head, and reserve 2 welding point.



<u>Step2:</u> After the modification, aligning the P / N welding point between the End-tip and the interposer. Welding the resistor 2500hm (4 groups of data + 1 CLK), and the Gnds.



In this way, the shortest distance makes the signal quality better than the End-tip jumper connection.









Way Station connection

- 1. Please install UFS Probe in Slot B of BusFinder 7264B+
- 2. Each Way Station has a USB type B interface, please use the corresponding USB cable to install it to the BusFinder front panel. When installing, please check the installation according to the top/bottom of the Way Station nameplate mark.



