

Lampiran 1. Pengukuran BER dan *Macrobending Losses*

Tabel 4.1 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap BER pada 1 Channel.

No.	Diameter (mm)	Jumlah bengkokan	Tegangan (Volt)	Total Bit Salah (Eb)	<i>Macrobending Losses</i> (dB)	BER
1	0	0	2,595	0	0,0000	0
2	20	1	2,501	0	0,3205	0
3		2	2,488	0	0,3657	0
4		3	2,478	0	0,4007	0
5		4	2,467	0	0,4394	0
6		5	2,450	0	0,4994	0
7	18	1	2,423	0	0,5957	0
8		2	2,420	0	0,6064	0
9		3	2,397	0	0,6894	0
10		4	2,375	0	0,7695	0
11		5	2,362	0	0,8171	0
12	16	1	2,432	0	0,5635	0
13		2	2,400	111	0,6785	$1,37 \times 10^{-6}$
14		3	2,350	100110	0,8614	$7,42 \times 10^{-6}$
15		4	2,321	1000110	0,9692	$1,37 \times 10^{-5}$
16		5	2,345	1100010	0,8799	$1,91 \times 10^{-5}$
17	14	1	2,357	0	0,8356	0
18		2	2,335	11001	0,9170	$4,88 \times 10^{-6}$
19		3	2,270	1010010	1,1622	$1,60 \times 10^{-5}$
20		4	2,245	1011100	1,2584	$1,81 \times 10^{-5}$
21		5	2,238	1100011	1,2855	$1,93 \times 10^{-5}$
22	12	1	2,352	1001011	0,8540	0
23		2	2,335	1010011	0,9170	$1,62 \times 10^{-5}$
24		3	2,271	1101001	1,1584	$2,05 \times 10^{-5}$
25		4	2,254	1111101	1,2237	$2,44 \times 10^{-5}$
26		5	2,215	11010110	1,3753	$4,18 \times 10^{-5}$

Tabel 4.2 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap BER pada 2 Channel.

No.	Diameter (mm)	Jumlah bengkokan	Tegangan (Volt)	Total Bit Salah (Eb)	<i>Macrobending Losses</i> (dB)	BER
1	0	0	2.587	0	0,0000	0
2	20	1	2.485	0	0,3494	0
3		2	2.467	0	0,4125	0
4		3	2.451	0	0,4691	0
5		4	2.447	0	0,4832	0
6		5	2.435	0	0,5259	0

7	18	1	2.435	0	0,5259	0
8		2	2.411	0	0,6120	0
9		3	2.387	0	0,6989	0
10		4	2.363	0	0,7866	0
11		5	2.351	0	0,8309	0
12	16	1	2.409	0	0,6192	0
13		2	2.385	10001	0,7062	$3,32 \times 10^{-6}$
14		3	2.377	1010001	0,7353	$1,58 \times 10^{-5}$
15		4	2.371	1010100	0,7573	$1,64 \times 10^{-5}$
16		5	2.224	1110101	1,3132	$2,28 \times 10^{-5}$
17	14	1	2.368	0	0,7683	0
18		2	2.340	11110	0,8716	$5,86 \times 10^{-6}$
19		3	2.289	1011011	1,0630	$1,77 \times 10^{-5}$
20		4	2.260	1110100	1,1738	$2,27 \times 10^{-5}$
21		5	2.215	10110110	1,3484	$3,55 \times 10^{-5}$
22	12	1	2.340	1011100	0,8716	$1,8 \times 10^{-5}$
23		2	2.321	1100111	0,9424	$2,01 \times 10^{-5}$
24		3	2.308	10000111	0,9912	$2,64 \times 10^{-5}$
25		4	2.242	10101100	1,2432	$3,36 \times 10^{-5}$
26		5	2.162	11011101	1,5588	$4,32 \times 10^{-5}$

Tabel 4.3 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap BER pada 3 Channel.

No.	Diameter (mm)	Jumlah bengkokan	Tegangan (Volt)	Total Bit Salah (Eb)	<i>Macrobending Losses</i> (dB)	BER
1	0	0	2.581	0	0	0
2	20	1	2.462	0	0.4100	0
3		2	2.448	0	0.4595	0
4		3	2.427	0	0.5343	0
5		4	2.425	0	0.5415	0
6		5	2.416	0	0.5738	0
7	18	1	2.418	0	0.5666	0
8		2	2.391	0	0.6642	0
9		3	2.366	0	0.7555	0
10		4	2.354	0	0.7996	0
11		5	2.349	0	0.8181	0
12	16	1	2.417	0	0.5702	0
13		2	2.396	11001	0.6460	$4,88 \times 10^{-6}$
14		3	2.372	1001100	0.7334	$1,48 \times 10^{-5}$
15		4	2.344	1101010	0.8366	$2,07 \times 10^{-5}$
16		5	2.323	10110001	0.9148	$3,46 \times 10^{-5}$
17	14	1	2.390	0	0.7481	0
18		2	2.325	101110	0.8514	$8,98 \times 10^{-6}$

19		3	2.275	1011111	1.0428	$1,85 \times 10^{-5}$
20		4	2.255	10011111	1.1536	$3,11 \times 10^{-5}$
21		5	2.185	10110100	1.3283	$3,52 \times 10^{-5}$
22		1	2.325	1101001	0.9073	$2,05 \times 10^{-5}$
23		2	2.312	1110000	0.9560	$2,19 \times 10^{-5}$
24	12	3	2.264	10000000	1.1382	$2,50 \times 10^{-5}$
25		4	2.170	11000010	1.5065	$3,79 \times 10^{-5}$
26		5	2.157	11100101	1.5588	$4,47 \times 10^{-5}$

Tabel 4.4 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap BER pada 4 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	Tegangan (Volt)	Total Bit Salah (Eb)	<i>Macrobending Losses</i> (dB)	BER
1	0	0	2.574	0	0,0000	0
2		1	2.456	0	0,4076	0
3		2	2.439	0	0,4679	0
4	20	3	2.426	0	0,5143	0
5		4	2.423	0	0,5251	0
6		5	2.387	0	0,6551	0
7		1	2.425	0	0,5179	0
8	18	2	2.389	0	0,6478	0
9		3	2.376	0	0,6952	0
10		4	2.361	0	0,7502	0
11		5	2.320	0	0,9024	0
12		1	2.391	0	0,6405	0
13	16	2	2.366	101000	0,7319	$7,81 \times 10^{-6}$
14		3	2.360	10011011	0,7539	$3,03 \times 10^{-5}$
15		4	2.336	10100100	0,8427	$3,20 \times 10^{-5}$
16		5	2.319	10101111	0,9061	$3,41 \times 10^{-5}$
17		1	2.343	0	0,8167	0
18	14	2	2.270	1111111	1,0916	$2,48 \times 10^{-5}$
19		3	2.260	10101100	1,1300	$3,36 \times 10^{-5}$
20		4	2.208	10101101	1,3322	$3,38 \times 10^{-5}$
21		5	2.185	11000001	1,4231	$3,77 \times 10^{-5}$
22		1	2.310	1110011	0,9399	$2,25 \times 10^{-5}$
23	12	2	2.253	101111	1,1569	$2,48 \times 10^{-5}$
24		3	2.205	11000011	1,3441	$3,81 \times 10^{-5}$
25		4	2.187	11010101	1,4152	$4,16 \times 10^{-5}$
26		5	2.130	11101000	1,6446	$4,53 \times 10^{-5}$

Tabel 4.5 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap BER pada 5 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	Tegangan (Volt)	Total Bit Salah (Eb)	<i>Macrobending Losses</i> (dB)	BER
1	0	0	2.571	0	0,0000	0
2	20	1	2.446	0	0,4329	0
3		2	2.444	0	0,4400	0
4		3	2.432	0	0,4828	0
5		4	2.430	0	0,4899	0
6		5	2.410	0	0,5617	0
7	18	1	2.372	0	0,6997	0
8		2	2.367	0	0,7181	0
9		3	2.342	0	0,8103	0
10		4	2.321	0	0,8885	0
11		5	2.268	0	1,0892	0
12	16	1	2.372	0	0,6997	0
13		2	2.342	111010	0,8103	$1,13 \times 10^{-5}$
14		3	2.336	10010010	0,8326	$2,85 \times 10^{-5}$
15		4	2.317	10011100	0,9035	$3,05 \times 10^{-5}$
16		5	2.268	10110100	1,0892	$3,52 \times 10^{-5}$
17	14	1	2.312	0	0,9223	0
18		2	2.292	1101110	0,9977	$2,15 \times 10^{-5}$
19		3	2.264	10100111	1,1045	$3,26 \times 10^{-5}$
20		4	2.225	11000000	1,2554	$3,75 \times 10^{-5}$
21		5	2.216	11000100	1,2906	$3,83 \times 10^{-5}$
22	12	1	2.295	1111101	0,9864	$2,44 \times 10^{-5}$
23		2	2.241	10010101	1,1932	$2,91 \times 10^{-5}$
24		3	2.222	10111110	1,2672	$3,71 \times 10^{-5}$
25		4	2.206	11001111	1,3299	$4,04 \times 10^{-5}$
26		5	2.060	11111000	1,9247	$4,84 \times 10^{-5}$

Tabel 4.6 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap BER pada 6 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	Tegangan (Volt)	Total Bit Salah (Eb)	<i>Macrobending Losses</i> (dB)	BER
1	0	0	2.568		0,0000	0
2	20	1	2.454		0,3944	0
3		2	2.444		0,4299	0
4		3	2.436		0,4583	0
5		4	2.432		0,4726	0
6		5	2.406		0,5660	0
7	18	1	2.381		0,6567	0
8		2	2.375		0,6786	0
9		3	2.361		0,7310	0
10		4	2.351		0,7668	0
11		5	2.321		0,8784	0
12	16	1	2.364	0	0,7189	0
13		2	2.323	1001100	0,8709	$1,48 \times 10^{-5}$
14		3	2.295	1111101	0,9762	$2,44 \times 10^{-5}$
15		4	2.258	11000000	1,1174	$3,75 \times 10^{-5}$
16		5	2.230	11000011	1,2258	$3,81 \times 10^{-5}$
17	14	1	2.313	0	0,9084	0
18		2	2.255	1100010	1,1289	$1,91 \times 10^{-5}$
19		3	2.250	10001000	1,1482	$2,66 \times 10^{-5}$
20		4	2.246	11001000	1,1637	$3,91 \times 10^{-5}$
21		5	2.212	11100010	1,2962	$4,41 \times 10^{-5}$
22	12	1	2.275	10011110	1,0523	$3,08 \times 10^{-5}$
23		2	2.255	11000011	1,1289	$3,81 \times 10^{-5}$
24		3	2.230	11100001	1,2258	$4,39 \times 10^{-5}$
25		4	2.155	11110001	1,5229	$4,71 \times 10^{-5}$
26		5	1.950	11111001	2,3912	$4,86 \times 10^{-5}$

Lampiran 2. Pengukuran Noise Margin dan Macrobending Losses

Tabel 4.7 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Noise Margin* pada 1 Channel.

No.	Diameter (mm)	Jumlah bengkokan	V1 (Volt)	V2 (Volt)	Noise Margin (%)	Macrobending Losses (dB)
1	0	0	3.96	4.62	85.714	0,0000
2	20	1	3.74	4.47	83.669	0,3205
3		2	3.66	4.47	81.879	0,3657
4		3	3.37	4.18	80.622	0,4007
5		4	3.22	4.1	78.537	0,4394
6		5	3.15	4.03	78.164	0,4994
7	18	1	3.59	4.32	83.102	0,5957
8		2	3.44	4.25	80.941	0,6064
9		3	3.52	4.47	78.747	0,6894
10		4	3.49	4.56	76.535	0,7695
11		5	3.45	4.52	76.327	0,8171
12	16	1	3.45	4.18	82.536	0,5635
13		2	3.08	3.88	79.381	0,6785
14		3	3.51	4.54	77.313	0,8614
15		4	3.49	4.54	76.872	0,9692
16		5	3.35	4.39	76.310	0,8799
17	14	1	3.37	4.25	79.294	0,8356
18		2	3.15	4.03	78.164	0,9170
19		3	3.52	4.54	77.533	1,1622
20		4	3.15	4.25	74.118	1,2584
21		5	3.15	4.32	72.917	1,2855
22	12	1	3.15	4.03	78.164	0,8540
23		2	3.52	4.54	77.533	0,9170
24		3	3.3	4.35	75.862	1,1584
25		4	3.22	4.36	73.853	1,2237
26		5	3.15	4.32	72.917	1,3753

Tabel 4.8 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Noise Margin* pada 2 Channel.

No.	Diameter (mm)	Jumlah bengkokan	V1 (Volt)	V2 (Volt)	Noise Margin (%)	Macrobending Losses (dB)
1	0	0	4.03	4.84	84.663	0,0000
2	20	1	3.96	4.76	83.193	0,3494
3		2	3.88	4.76	81.513	0,4125
4		3	3.78	4.76	79.412	0,4691
5		4	3.77	4.76	79.202	0,4832
6		5	3.66	4.68	78.205	0,5259
7	18	1	3.88	4.76	81.513	0,5259

8		2	3.84	4.76	80.672	0,6120
9		3	3.73	4.69	79.531	0,6989
10		4	3.67	4.76	77.101	0,7866
11		5	3.63	4.76	76.261	0,8309
12	16	1	3.96	4.91	80.652	0,6192
13		2	3.81	4.84	78.719	0,7062
14		3	3.66	4.76	76.891	0,7353
15		4	3.51	4.62	75.974	0,7573
16		5	3.22	4.4	73.182	1,3132
17	14	1	3.88	4.91	79.022	0,7683
18		2	3.74	4.84	77.273	0,8716
19		3	3.59	4.69	76.546	1,0630
20		4	3.3	4.4	75.000	1,1738
21		5	3.37	4.62	72.944	1,3484
22	12	1	3.74	4.76	78.571	0,8716
23		2	3.59	4.69	76.546	0,9424
24		3	3.15	4.32	72.917	0,9912
25		4	3.08	4.25	72.471	1,2432
26		5	3	4.18	71.770	1,5588

Tabel 4.9 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Noise Margin* pada 3 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	V1 (Volt)	V2 (Volt)	Noise Margin (%)	Macrobending Losses (dB)
1	0	0	3.96	4.76	83.193	0
2	20	1	3.96	4.83	81.988	0.4100
3		2	3.88	4.84	80.165	0.4595
4		3	3.81	4.76	80.042	0.5343
5		4	3.81	4.84	78.719	0.5415
6		5	3.74	4.76	77.273	0.5738
7	18	1	3.89	4.76	81.723	0.5666
8		2	3.66	4.62	79.221	0.6642
9		3	3.59	4.54	79.075	0.7555
10		4	3.63	4.62	78.571	0.7996
11		5	3.52	4.54	77.533	0.8181
12	16	1	3.74	4.62	80.952	0.5702
13		2	3.67	4.69	78.252	0.6460
14		3	3.52	4.54	77.533	0.7334
15		4	3.49	4.54	76.872	0.8366
16		5	3.45	4.52	76.327	0.9148
17	14	1	3.67	4.61	79.610	0.7481
18		2	3.59	4.62	77.706	0.8514
19		3	3.51	4.54	77.313	1.0428
20		4	3.49	4.56	76.535	1.1536

21		5	3.35	4.39	76.310	1.3283
22		1	3.74	4.76	78.571	0.9073
23		2	3.52	4.54	77.533	0.9560
24	12	3	3.22	4.4	73.182	1.1382
25		4	2.99	4.18	71.531	1.5065
26		5	2.86	4.18	68.421	1.5588

Tabel 4.10 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Noise Margin* pada 4 Channel.

No.	Diameter (mm)	Jumlah bengkokan	V1 (Volt)	V2 (Volt)	Noise Margin (%)	<i>Macrobending Losses</i> (dB)
1	0	0	3.88	4.76	81.513	0,0000
2		1	3.88	4.76	81.513	0,4076
3		2	3.81	4.76	80.042	0,4679
4	20	3	3.74	4.69	79.744	0,5143
5		4	3.74	4.69	79.744	0,5251
6		5	3.7	4.63	79.914	0,6551
7		1	3.74	4.62	81.425	0,5179
8	18	2	3.59	4.62	77.706	0,6478
9		3	3.44	4.47	76.957	0,6952
10		4	3.3	4.32	76.389	0,7502
11		5	3	4.25	75.771	0,9024
12		1	3.66	4.54	80.952	0,6405
13	16	2	3.52	4.47	78.747	0,7319
14		3	3.44	4.47	76.957	0,7539
15		4	3.37	4.4	76.591	0,8427
16		5	3.3	4.32	76.389	0,9061
17		1	3.77	4.63	80.617	0,8167
18	14	2	3.63	4.63	78.402	1,0916
19		3	3.56	4.62	77.056	1,1300
20		4	3.34	4.41	75.909	1,3322
21		5	3.44	4.54	73.733	1,4231
22		1	3.45	4.47	77.181	0,9399
23	12	2	3.34	4.4	75.737	1,1569
24		3	3.34	4.56	73.246	1,3441
25		4	3.2	4.34	70.588	1,4152
26		5	2.84	4.2	67.619	1,6446

Tabel 4.11 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Noise Margin* pada 5 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	V1 (Volt)	V2 (Volt)	Noise Margin (%)	<i>Macrobending Losses</i> (dB)
1	0	0	4.1	5.05	81.543	0,0000
2	20	1	3.96	4.98	80.851	0,4329
3		2	3.96	5.06	79.633	0,4400
4		3	3.91	4.91	78.719	0,4828
5		4	3.81	4.84	78.261	0,4899
6		5	3.66	4.69	78.038	0,5617
7	18	1	3.8	4.7	79.518	0,6997
8		2	3.74	4.76	78.571	0,7181
9		3	3.67	4.69	78.252	0,8103
10		4	3.56	4.69	75.906	0,8885
11		5	3.44	4.61	74.620	1,0892
12	16	1	3.88	4.98	78.218	0,6997
13		2	3.81	4.91	77.597	0,8103
14		3	3.74	4.91	76.546	0,8326
15		4	3.59	4.69	76.171	0,9035
16		5	3.37	4.54	74.229	1,0892
17	14	1	3.95	5.05	77.912	0,9223
18		2	3.66	4.84	75.620	0,9977
19		3	3.52	4.69	75.053	1,1045
20		4	3.3	4.62	71.429	1,2554
21		5	2.86	4.32	66.204	1,2906
22	12	1	3.52	4.84	72.727	0,9864
23		2	3.3	4.62	71.429	1,1932
24		3	3.08	4.55	67.692	1,2672
25		4	2.93	4.47	65.548	1,3299
26		5	2.7	4.27	63.232	1,9247

Tabel 4.12 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Noise Margin* pada 6 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	V1 (Volt)	V2 (Volt)	Noise Margin (%)	<i>Macrobending Losses</i> (dB)
1	0	0	3.77	4.69	78.343	0,0000
2	20	1	3.52	4.54	77.533	0,3944
3		2	3.37	4.47	75.392	0,4299
4		3	3.3	4.47	73.826	0,4583
5		4	3	4.25	70.588	0,4726
6		5	2.71	4.32	62.731	0,5660
7	18	1	3.29	4.47	73.602	0,6567
8		2	3.15	4.32	72.917	0,6786

9		3	3.01	4.25	70.824	0,7310
10		4	2.64	3.88	68.041	0,7668
11		5	2.42	3.91	61.893	0,8784
12	16	1	3.15	4.32	72.917	0,7189
13		2	2.97	4.32	68.750	0,8709
14		3	2.78	4.25	65.412	0,9762
15		4	2.56	4.13	61.985	1,1174
16		5	2.51	4.13	60.775	1,2258
17	14	1	3.3	4.54	72.687	0.9084
18		2	2.86	4.25	67.294	1.1289
19		3	2.7	4.13	65.375	1.1482
20		4	2.49	4.1	60.732	1.1637
21		5	2.2	3.88	56.701	1.2962
22	12	1	2.63	4.2	62.619	1,0523
23		2	2.51	4.26	58.920	1,1289
24		3	2.14	3.7	57.838	1,2258
25		4	2.21	4.06	54.433	1,5229
26		5	2.11	4.06	51.970	2,3912



Lampiran 3. Pengukuran *Timing Jitter* dan *Macrobending Losses*

Tabel 4.13 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Timing Jitter* pada 1 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	ΔT (μs)	Tb (μs)	Timming Jitter (%)	<i>Macrobending Losses</i> (dB)
1	0	0	0.042	0.974	4.31211499	0,0000
2	20	1	0.043	0.973	4.419321686	0,3205
3		2	0.054	0.979	5.515832482	0,3657
4		3	0.054	0.979	5.515832482	0,4007
5		4	0.054	0.975	5.538461538	0,4394
6		5	0.065	0.986	6.592292089	0,4994
7	18	1	0.053	0.97	5.463917526	0,5957
8		2	0.061	0.978	6.237218814	0,6064
9		3	0.065	0.978	6.646216769	0,6894
10		4	0.068	0.978	6.952965235	0,7695
11		5	0.073	0.983	7.426246185	0,8171
12	16	1	0.057	0.974	5.852156057	0,5635
13		2	0.066	0.975	6.769230769	0,6785
14		3	0.08	0.989	8.088978766	0,8614
15		4	0.096	0.979	9.805924413	0,9692
16		5	0.1	0.995	10.05025126	0,8799
17	14	1	0.072	0.979	7.354443309	0,8356
18		2	0.08	0.979	8.171603677	0,9170
19		3	0.096	0.974	9.856262834	1,1622
20		4	0.112	1.014	11.04536489	1,2584
21		5	0.118	0.974	12.11498973	1,2855
22	12	1	0.079	0.985	8.020304569	0,8540
23		2	0.084	0.978	8.588957055	0,9170
24		3	0.103	0.961	10.71800208	1,1584
25		4	0.111	0.963	11.52647975	1,2237
26		5	0.118	0.964	12.2406639	1,3753

Tabel 4.14 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Timing Jitter* pada 2 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	ΔT (μs)	Tb (μs)	Timming Jitter (%)	<i>Macrobending Losses</i> (dB)
1	0	0	0.053	0.955	5.54973822	0,0000
2	20	1	0.054	0.971	5.561277034	0,3494
3		2	0.061	0.971	6.282183316	0,4125
4		3	0.069	0.979	7.048008172	0,4691
5		4	0.085	0.979	8.682328907	0,4832
6		5	0.096	0.979	9.805924413	0,5259
7	18	1	0.061	0.978	6.237218814	0,5259

8		2	0.068	0.979	6.945863126	0,6120
9		3	0.076	0.978	7.770961145	0,6989
10		4	0.1	0.995	10.05025126	0,7866
11		5	0.1	0.981	10.19367992	0,8309
12	16	1	0.062	0.987	6.281661601	0,6192
13		2	0.065	0.979	6.639427988	0,7062
14		3	0.069	0.975	7.076923077	0,7353
15		4	0.081	0.967	8.376421923	0,7573
16		5	0.096	0.979	9.805924413	1,3132
17	14	1	0.069	0.975	7.076923077	0,7683
18		2	0.077	0.974	7.905544148	0,8716
19		3	0.08	0.979	8.171603677	1,0630
20		4	0.095	0.982	9.67413442	1,1738
21		5	0.104	0.983	10.57985758	1,3484
22	12	1	0.085	0.979	8.682328907	0,8716
23		2	0.096	0.979	9.805924413	0,9424
24		3	0.133	0.966	13.76811594	0,9912
25		4	0.134	0.952	14.07563025	1,2432
26		5	0.156	0.982	15.88594705	1,5588

Tabel 4.15 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Timing Jitter* pada 3 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	ΔT (μs)	Tb (μs)	Timming Jitter (%)	<i>Macrobending Losses</i> (dB)
1	0	0	0.061	0.974	6.262833676	0
2	20	1	0.064	0.958	6.680584551	0.4100
3		2	0.073	0.96	7.604166667	0.4595
4		3	0.095	0.969	9.803921569	0.5343
5		4	0.099	0.974	10.16427105	0.5415
6		5	0.104	0.983	10.57985758	0.5738
7	18	1	0.069	0.982	7.026476578	0.5666
8		2	0.08	0.986	8.113590264	0.6642
9		3	0.099	0.978	10.12269939	0.7555
10		4	0.103	0.974	10.57494867	0.7996
11		5	0.111	0.986	11.25760649	0.8181
12	16	1	0.081	0.972	8.333333333	0.5702
13		2	0.084	0.975	8.615384615	0.6460
14		3	0.099	0.967	10.23784902	0.7334
15		4	0.11	0.97	11.34020619	0.8366
16		5	0.119	0.974	12.21765914	0.9148
17	14	1	0.092	0.967	9.513960703	0.7481
18		2	0.111	0.979	11.3381001	0.8514
19		3	0.115	0.967	11.89245088	1.0428
20		4	0.118	0.974	12.11498973	1.1536

21		5	0.12	0.98	12.24489796	1.3283
22		1	0.099	0.97	10.20618557	0.9073
23		2	0.111	0.963	11.52647975	0.9560
24	12	3	0.122	0.988	12.34817814	1.1382
25		4	0.126	0.986	12.77890467	1.5065
26		5	0.127	0.98	12.95918367	1.5588

Tabel 4.16 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Timing Jitter* pada 4 Channel.

No.	Diameter (mm)	Jumlah bengkokan	ΔT (μs)	Tb (μs)	Timing Jitter (%)	<i>Macrobending Losses</i> (dB)
1	0	0	0.073	0.978	7.464212679	0,0000
2	20	1	0.076	0.97	7.835051546	0,4076
3		2	0.077	0.972	7.9218107	0,4679
4		3	0.08	0.978	8.1799591	0,5143
5		4	0.08	0.974	8.213552361	0,5251
6		5	0.088	0.967	9.100310238	0,6551
7	18	1	0.084	0.971	8.650875386	0,5179
8		2	0.084	0.971	8.650875386	0,6478
9		3	0.085	0.979	8.682328907	0,6952
10		4	0.084	0.967	8.686659772	0,7502
11		5	0.098	0.969	10.11351909	0,9024
12	16	1	0.088	0.975	9.025641026	0,6405
13		2	0.088	0.975	9.025641026	0,7319
14		3	0.095	0.974	9.753593429	0,7539
15		4	0.102	0.978	10.42944785	0,8427
16		5	0.106	0.969	10.93911249	0,9061
17	14	1	0.096	0.971	9.886714727	0,8167
18		2	0.099	0.974	10.16427105	1,0916
19		3	0.099	0.97	10.20618557	1,1300
20		4	0.104	0.964	10.78838174	1,3322
21		5	0.114	0.943	12.08907741	1,4231
22	12	1	0.103	0.986	10.44624746	0,9399
23		2	0.104	0.98	10.6122449	1,1569
24		3	0.108	0.956	11.29707113	1,3441
25		4	0.111	0.947	11.72122492	1,4152
26		5	0.118	0.94	12.55319149	1,6446

Tabel 4.17 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Timing Jitter* pada 5 Channel.

No.	Diameter (mm)	Jumlah bengkokan	ΔT (μs)	Tb (μs)	Timing Jitter (%)	<i>Macrobending Losses</i> (dB)
1	0	0	0.072	0.97	7.422680412	0,0000
2	20	1	0.088	0.975	9.025641026	0,4329
3		2	0.089	0.971	9.165808445	0,4400
4		3	0.1	0.968	10.33057851	0,4828
5		4	0.103	0.971	10.60762101	0,4899
6		5	0.103	0.967	10.65149948	0,5617
7	18	1	0.096	0.967	9.927611169	0,6997
8		2	0.102	0.977	10.44012282	0,7181
9		3	0.104	0.975	10.66666667	0,8103
10		4	0.108	0.967	11.16856256	0,8885
11		5	0.111	0.971	11.4315139	1,0892
12	16	1	0.099	0.962	10.29106029	0,6997
13		2	0.101	0.972	10.3909465	0,8103
14		3	0.103	0.974	10.57494867	0,8326
15		4	0.111	0.968	11.46694215	0,9035
16		5	0.115	0.968	11.88016529	1,0892
17	14	1	0.103	0.971	10.60762101	0,9223
18		2	0.108	0.98	11.02040816	0,9977
19		3	0.108	0.972	11.11111111	1,1045
20		4	0.115	0.979	11.74668029	1,2554
21		5	0.115	0.968	11.88016529	1,2906
22	12	1	0.103	0.966	10.66252588	0,9864
23		2	0.11	0.958	11.4822547	1,1932
24		3	0.125	0.954	13.10272537	1,2672
25		4	0.133	0.966	13.76811594	1,3299
26		5	0.147	0.969	15.17027864	1,9247

Tabel Lampiran 4.18 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap *Timing Jitter* pada 6 Channel.

No.	Diameter (mm)	Jumlah bengkokan	ΔT (μs)	Tb (μs)	Timing Jitter (%)	<i>Macrobending Losses</i> (dB)
1	0	0	0.08	0.982	8.146639511	0,0000
2	20	1	0.1	0.971	10.29866117	0,3944
3		2	0.106	0.981	10.80530071	0,4299
4		3	0.112	0.983	11.39369278	0,4583
5		4	0.114	0.978	11.65644172	0,4726
6		5	0.115	0.982	11.7107943	0,5660
7	18	1	0.103	0.975	10.56410256	0,6567
8		2	0.11	0.977	11.25895599	0,6786
9		3	0.114	0.974	11.70431211	0,7310
10		4	0.115	0.979	11.74668029	0,7668
11		5	0.118	0.978	12.06543967	0,8784
12	16	1	0.103	0.97	10.6185567	0,7189
13		2	0.114	0.982	11.6089613	0,8709
14		3	0.114	0.971	11.74047374	0,9762
15		4	0.115	0.971	11.84346035	1,1174
16		5	0.118	0.974	12.11498973	1,2258
17	14	1	0.108	0.979	11.03166496	0.9084
18		2	0.115	0.98	11.73469388	1.1289
19		3	0.115	0.979	11.74668029	1.1482
20		4	0.116	0.976	11.8852459	1.1637
21		5	0.119	0.982	12.11812627	1.2962
22	12	1	0.111	0.972	11.41975309	1,0523
23		2	0.115	0.971	11.84346035	1,1289
24		3	0.119	0.974	12.21765914	1,2258
25		4	0.122	0.963	12.66874351	1,5229
26		5	0.135	0.954	14.1509434	2,3912

Lampiran 4. Pengukuran SNR dan *Macrobending Losses*

Tabel 4.19 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap SNR pada 1 Channel.

No.	Diameter (mm)	Jumlah bengkokan	Us	Un	SNR (dB)	<i>Macrobending Losses</i> (dB)
1	0	0	792	52	23.65443676	0,0000
2	20	1	783	66	21.48435653	0,3205
3		2	776	72	20.6505845	0,3657
4		3	755	82	19.28266198	0,4007
5		4	754	88	18.65777347	0,4394
6		5	745	87	18.6527404	0,4994
7	18	1	762	73	20.37264222	0,5957
8		2	755	81	19.38923866	0,6064
9		3	748	82	19.20175491	0,6894
10		4	741	89	18.40856403	0,7695
11		5	732	95	17.73574952	0,8171
12	16	1	763	74	20.26585636	0,5635
13		2	747	88	18.57675859	0,6785
14		3	748	96	17.8326073	0,8614
15		4	733	95	17.74760739	0,9692
16		5	726	104	16.87806563	0,8799
17	14	1	763	74	20.26585636	0,8356
18		2	740	81	19.21493402	0,9170
19		3	732	109	16.54169166	1,1622
20		4	718	125	15.18428862	1,2584
21		5	696	140	13.92962408	1,2855
22	12	1	740	96	17.73920973	0,8540
23		2	732	104	16.94955484	0,9170
24		3	726	117	15.85501518	1,1584
25		4	702	138	14.12916051	1,2237
26		5	696	148	13.44695048	1,3753

Tabel 4.20 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap SNR pada 2 Channel.

No.	Diameter (mm)	Jumlah bengkokan	Us	Un	SNR (dB)	<i>Macrobending Losses</i> (dB)
1	0	0	791	66	21.57265096	0,0000
2	20	1	784	73	20.61986405	0,3494
3		2	784	81	19.71662088	0,4125
4		3	777	96	18.16299572	0,4691
5		4	747	102	17.2944086	0,4832
6		5	714	113	16.01239537	0,5259
7	18	1	777	81	19.63872	0,5259

8		2	761	87	18.83730808	0,6120
9		3	755	103	17.30219454	0,6989
10		4	747	110	16.63855833	0,7866
11		5	719	140	14.21201709	0,8309
12	16	1	748	103	17.22128746	0,6192
13		2	747	110	16.63855833	0,7062
14		3	711	125	15.09919175	0,7353
15		4	719	140	14.21201709	0,7573
16		5	696	140	13.92962408	1,3132
17	14	1	747	109	16.71788208	0,7683
18		2	733	117	15.93836226	0,8716
19		3	725	132	14.79528151	1,0630
20		4	711	148	13.63215771	1,1738
21		5	696	148	13.44695048	1,3484
22	12	1	733	109	16.55354953	0,8716
23		2	726	134	14.67663645	0,9424
24		3	718	139	14.26219288	0,9912
25		4	689	147	13.41803774	1,2432
26		5	688	148	13.34653446	1,5588

Tabel 4.21 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap SNR pada 3 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	Us	Un	SNR (dB)	<i>Macrobending Losses</i> (dB)
1	0	0	762	80	19.57729969	0
2	20	1	754	87	18.75704187	0.4100
3		2	754	95	17.99295481	0.4595
4		3	748	96	17.8326073	0.5343
5		4	740	102	17.21263096	0.5415
6		5	741	110	16.56851046	0.5738
7	18	1	740	95	17.83016229	0.5666
8		2	733	103	17.045335	0.6642
9		3	725	110	16.37890643	0.7555
10		4	718	117	15.75877165	0.7996
11		5	717	125	15.17218285	0.8181
12	16	1	732	110	16.46236792	0.5702
13		2	725	117	15.8430429	0.6460
14		3	718	117	15.75877165	0.7334
15		4	718	124	15.25405518	0.8366
16		5	696	125	14.91398453	0.9148
17	14	1	720	117	15.78293269	0.7481
18		2	718	124	15.25405518	0.8514
19		3	703	125	15.00090624	1.0428
20		4	696	132	14.44070617	1.1536

21		5	688	147	13.40542207	1.3283
22		1	718	117	15.75877165	0.9073
23		2	711	126	15.02998111	0.9560
24	12	3	696	132	14.44070617	1.1382
25		4	689	139	13.90408843	1.5065
26		5	696	154	13.10177038	1.5588

Tabel 4.22 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap SNR pada 4 Channel.

No.	Diameter (mm)	Jumlah bengkokan	Us	Un	SNR (dB)	<i>Macrobending Losses</i> (dB)
1	0	0	755	80	19.49713929	0,0000
2		1	740	88	18.49498095	0,4076
3		2	733	95	17.74760739	0,4679
4	20	3	725	103	16.95001564	0,5143
5		4	715	112	16.10176038	0,5251
6		5	718	117	15.75877165	0,6551
7		1	733	102	17.13007606	0,5179
8		2	725	103	16.95001564	0,6478
9	18	3	718	110	16.29463518	0,6952
10		4	718	117	15.75877165	0,7502
11		5	710	118	15.58752683	0,9024
12		1	725	103	16.95001564	0,6405
13		2	718	110	16.29463518	0,7319
14	16	3	711	117	15.67367478	0,7539
15		4	710	125	15.08696671	0,8427
16		5	695	133	14.36266327	0,9061
17		1	718	110	16.29463518	0,8167
18		2	711	110	16.20953831	1,0916
19	14	3	696	117	15.48846756	1,1300
20		4	689	124	14.89595073	1,3322
21		5	689	139	13.90408843	1,4231
22		1	718	124	15.25405518	0,9399
23		2	710	124	15.15673327	1,1569
24	12	3	689	139	13.90408843	1,3441
25		4	688	148	13.34653446	1,4152
26		5	674	147	13.22685124	1,6446

Tabel 4.23 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap SNR pada 5 Channel.

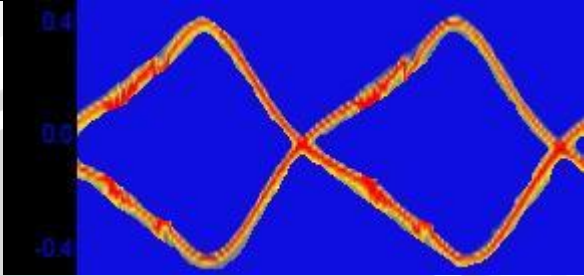
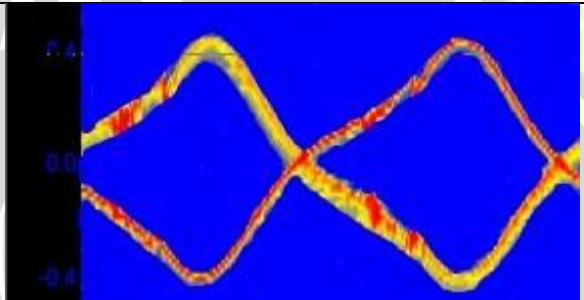
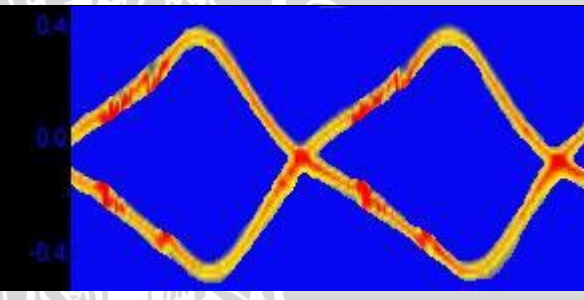
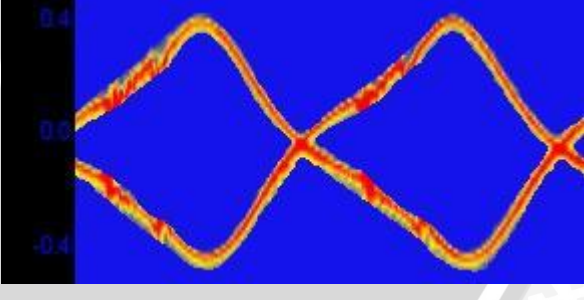
No.	Diameter (mm)	Jumlah bengkokan	Us	Un	SNR (dB)	<i>Macrobending Losses</i> (dB)
1	0	0	747	81	19.29671166	0,0000
2	20	1	725	88	18.31710669	0,4329
3		2	725	95	17.65228803	0,4400
4		3	718	110	16.29463518	0,4828
5		4	704	117	15.58773595	0,4899
6		5	696	132	14.44070617	0,5617
7	18	1	725	95	17.65228803	0,6997
8		2	711	103	16.78064752	0,7181
9		3	703	117	15.57538927	0,8103
10		4	696	124	14.98375109	0,8885
11		5	688	133	14.27473595	1,0892
12	16	1	718	103	16.86574439	0,6997
13		2	710	111	16.1187074	0,8103
14		3	704	125	15.01325292	0,8326
15		4	704	132	14.53997456	0,9035
16		5	697	139	14.00435956	1,0892
17	14	1	718	118	15.68484874	0,9223
18		2	711	125	15.09919175	0,9977
19		3	703	132	14.52762788	1,1045
20		4	696	140	13.92962408	1,2554
21		5	680	143	13.5434575	1,2906
22	12	1	710	125	15.08696671	0,9864
23		2	696	125	14.91398453	1,1932
24		3	688	132	14.34029014	1,2672
25		4	680	140	13.72761754	1,3299
26		5	675	153	12.89224684	1,9247

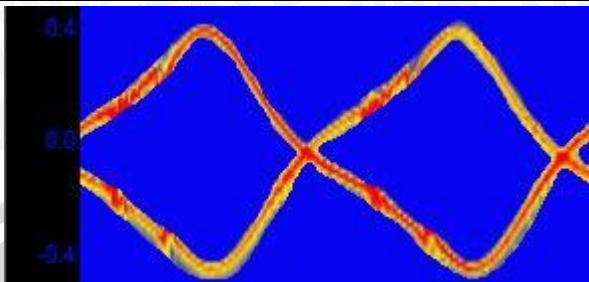
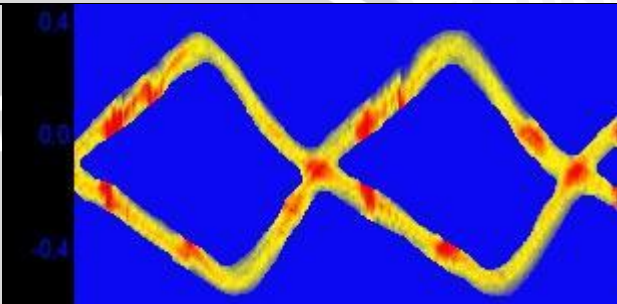
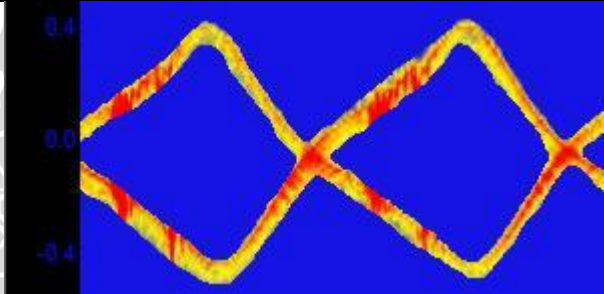
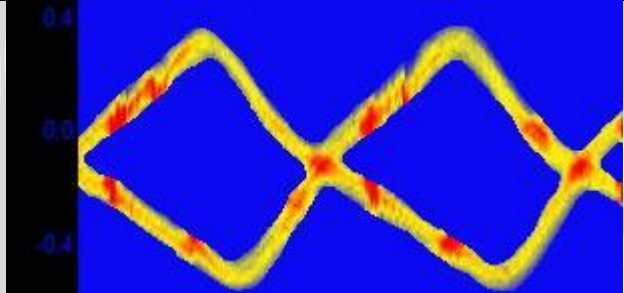
Tabel 4.24 Hasil Pengukuran Pengaruh *Macrobending Losses* Terhadap SNR pada 6 *Channel*.

No.	Diameter (mm)	Jumlah bengkokan	Us	Un	SNR (dB)	<i>Macrobending Losses</i> (dB)
1	0	0	725	88	18.31710669	0,0000
2	20	1	719	94	17.67202074	0,3944
3		2	718	103	16.86574439	0,4299
4		3	718	110	16.29463518	0,4583
5		4	711	117	15.67367478	0,4726
6		5	696	118	15.41454465	0,5660
7	18	1	718	103	16.86574439	0,6567
8		2	718	110	16.29463518	0,6786
9		3	718	125	15.18428862	0,7310
10		4	711	124	15.16895831	0,7668
11		5	704	124	15.08301948	0,8784
12	16	1	718	110	16.29463518	0,7189
13		2	711	118	15.59975187	0,8709
14		3	703	118	15.50146635	0,9762
15		4	696	118	15.41454465	1,1174
16		5	711	131	14.6919661	1,2258
17	14	1	704	118	15.51381304	0.9084
18		2	696	118	15.41454465	1.1289
19		3	696	118	15.41454465	1.1482
20		4	688	118	15.31412862	1.1637
21		5	688	118	15.31412862	1.2962
22	12	1	703	118	15.50146635	1,0523
23		2	696	118	15.41454465	1,1289
24		3	680	118	15.21253811	1,2258
25		4	675	118	15.14843531	1,5229
26		5	579	118	13.81593113	2,3912

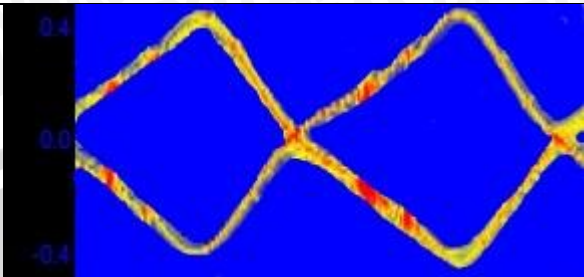
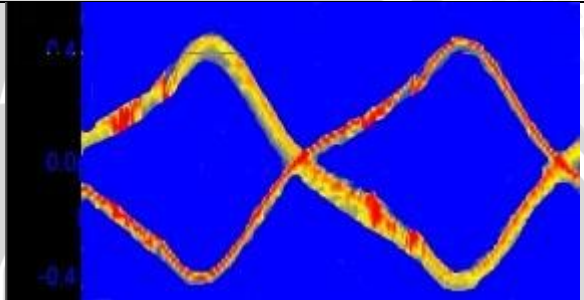
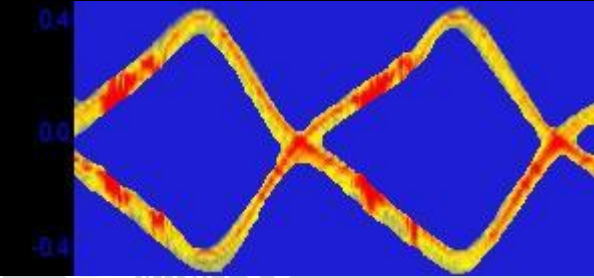
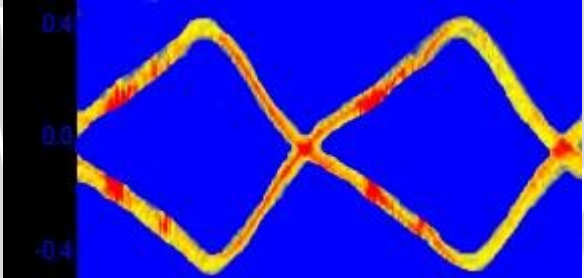
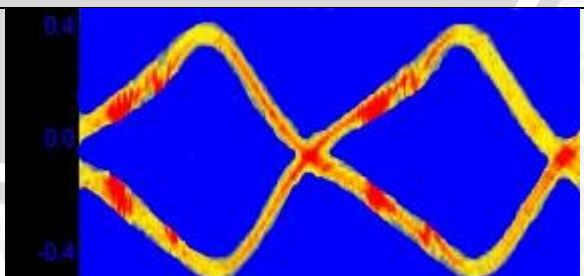
Lampiran 5. Tampilan Pola Eye Pattern

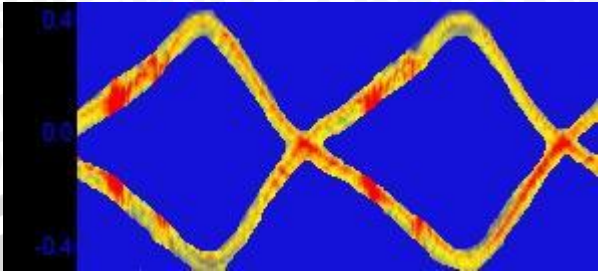
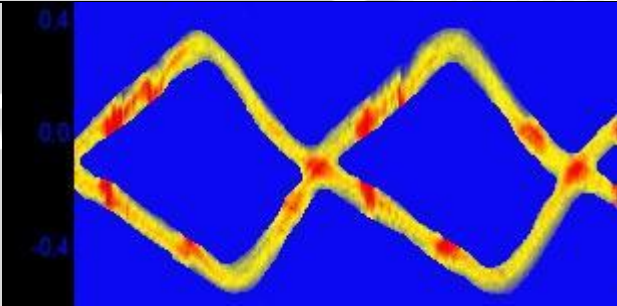
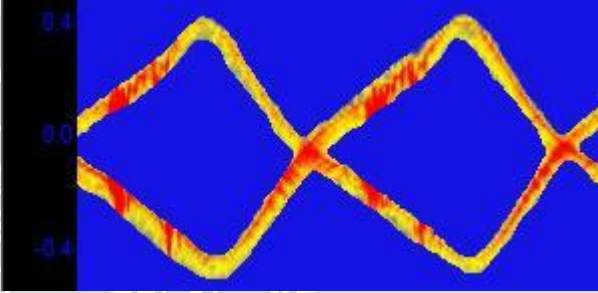
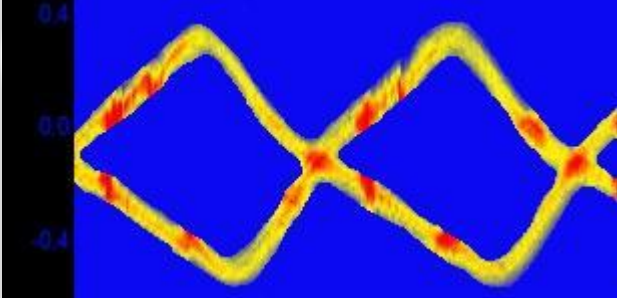
1) Tampilan Pola Eye Pattern pada 1 channel

No.	Diameter (mm)	Jumlah bengkokan	Pola Eye Pattern
1.	0	0	
2.	20	1	
		2	
		3	
		4	
		5	
3.	18	1	
		2	
		3	
		4	
		5	
4.	16	1	
		2	
		3	
		4	
		5	

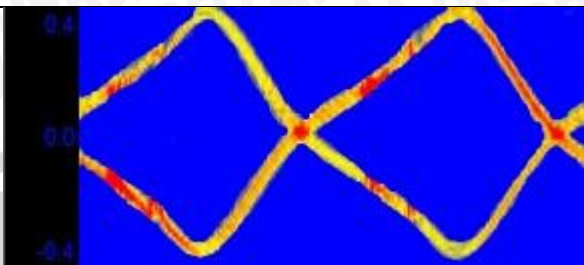
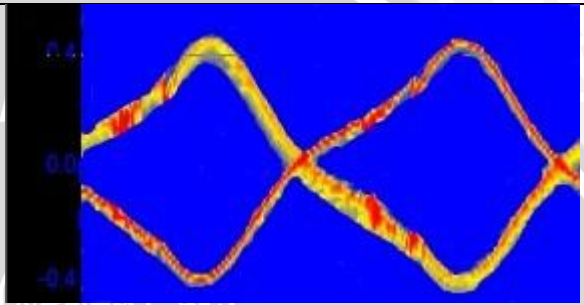
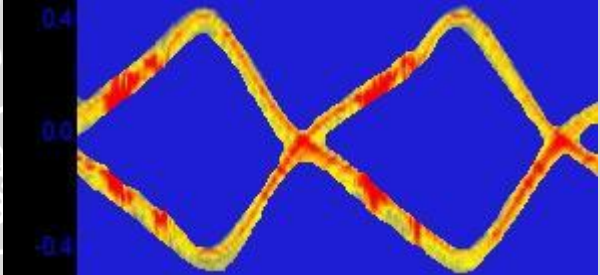
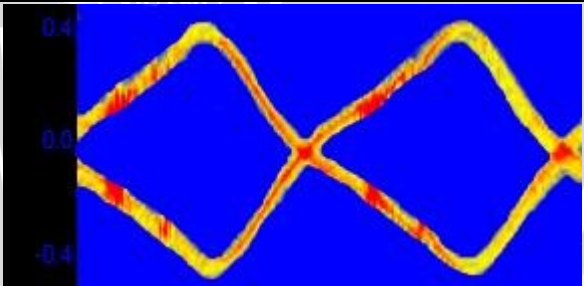
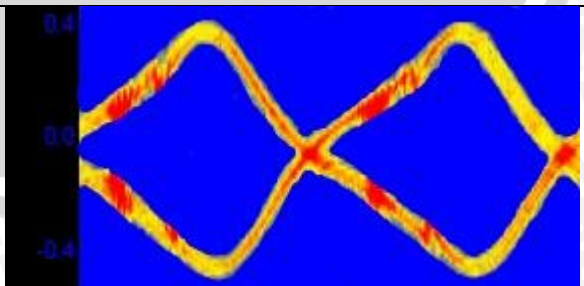
No.	Diameter (mm)	Jumlah bengkokan	Pola Eye Pattern
5.	14	1	
		2	
		3	
		4	
		5	
6.	12	1	
		2	
		3	
		4	
		5	

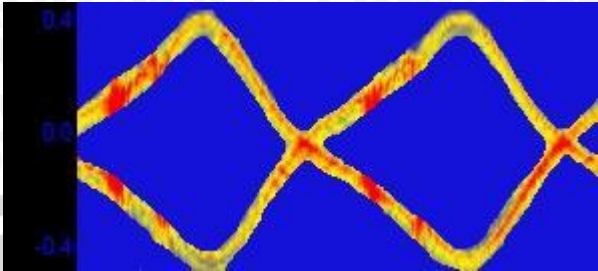
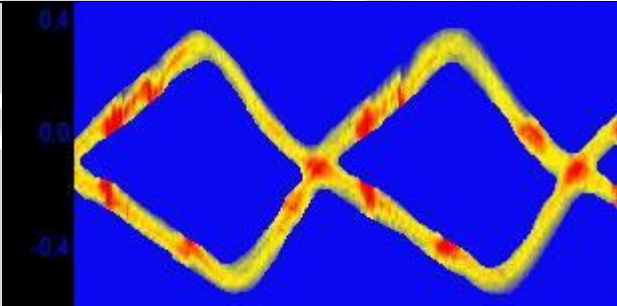
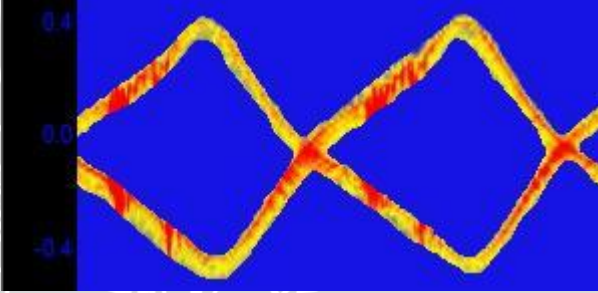
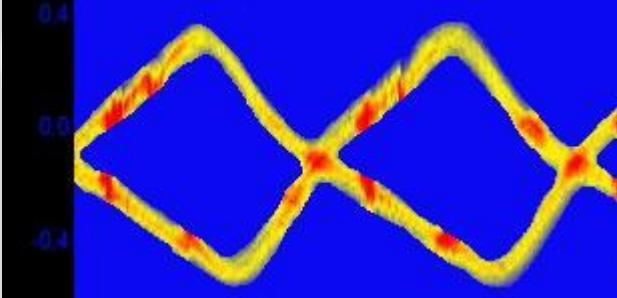
2) Tampilan Pola *Eye Pattern* pada 2 channel

No.	Diameter (mm)	Jumlah bengkokan	Pola <i>Eye Pattern</i>
1.	0	0	
2.	20	1	
		2	
		3	
		4	
		5	
3.	18	1	
		2	
		3	
		4	
		5	
4.	16	1	
		2	
		3	
		4	
		5	

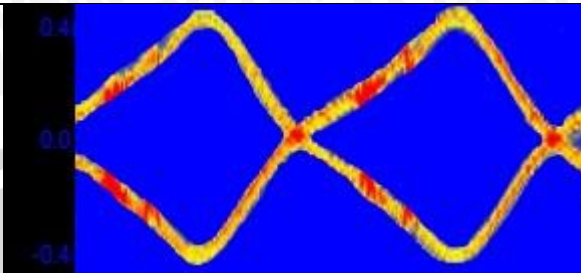
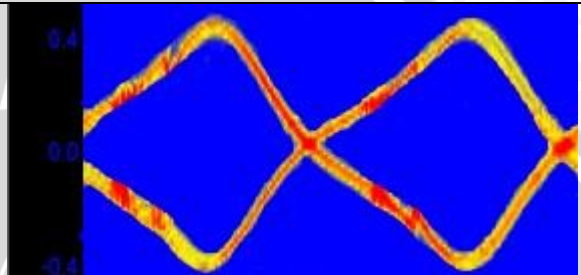
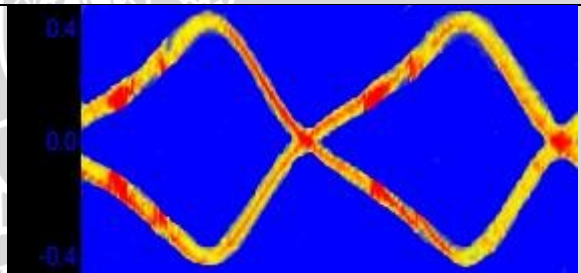
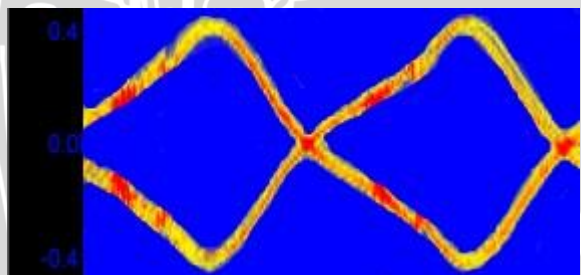
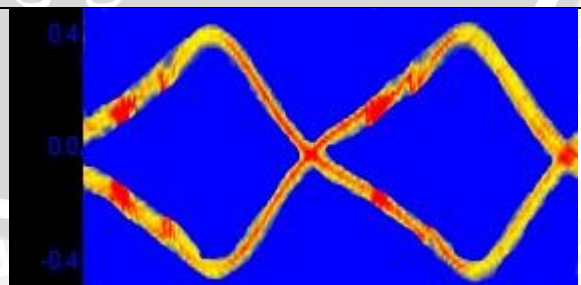
No.	Diameter (mm)	Jumlah bengkokan	Pola Eye Pattern
5.	14	1	
		2	
		3	
		4	
		5	
6.	12	1	
		2	
		3	
		4	
		5	

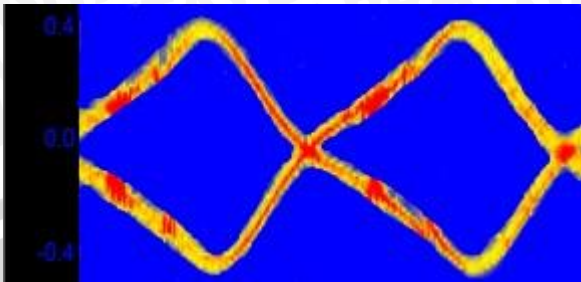
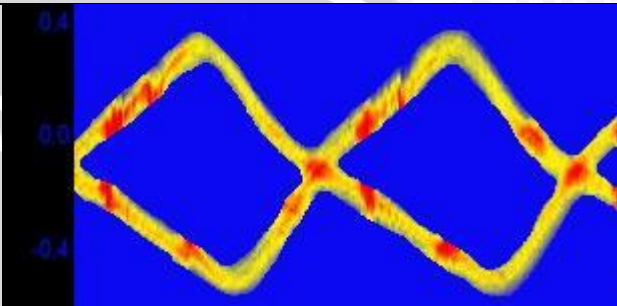
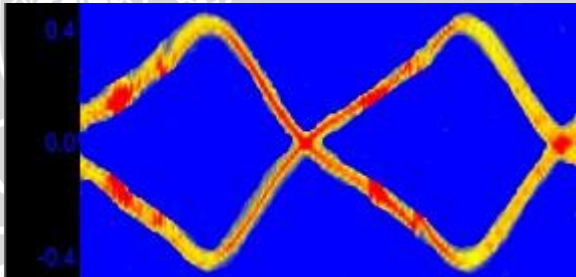
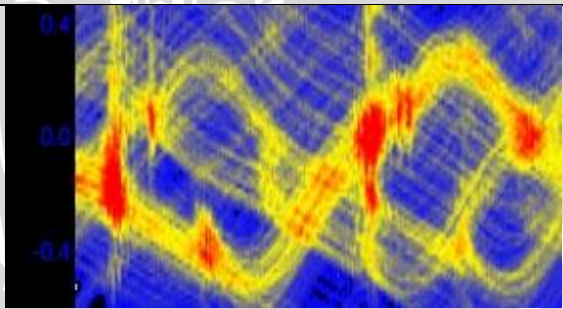
3) Tampilan Pola *Eye Pattern* pada 3 channel

No.	Diameter (mm)	Jumlah bengkokan	Pola <i>Eye Pattern</i>
1.	0	0	
2.	20	1	
		2	
		3	
		4	
		5	
3.	18	1	
		2	
		3	
		4	
		5	
4.	16	1	
		2	
		3	
		4	
		5	

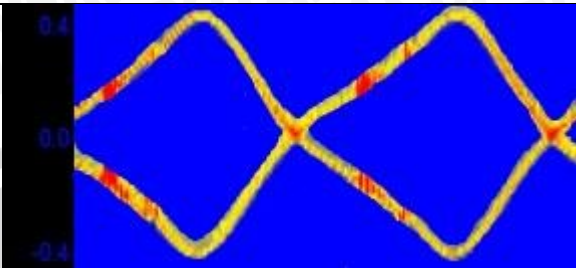
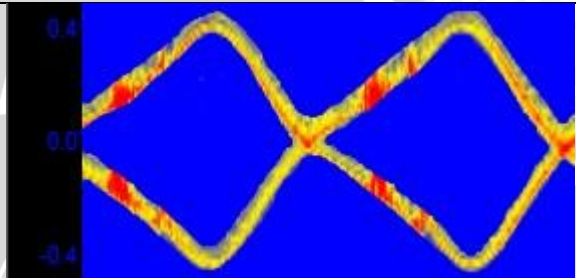
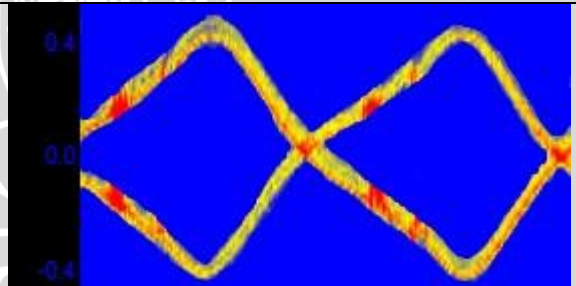
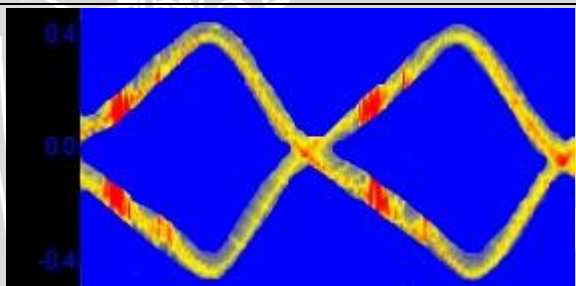
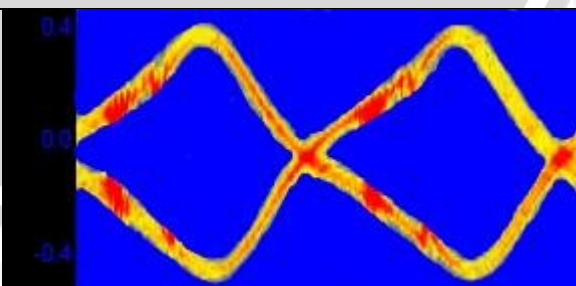
No.	Diameter (mm)	Jumlah bengkokan	Pola Eye Pattern
5.	14	1	
		2	
		3	
		4	
		5	
6.	12	1	
		2	
		3	
		4	
		5	

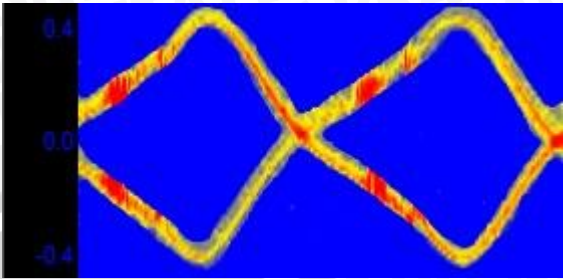
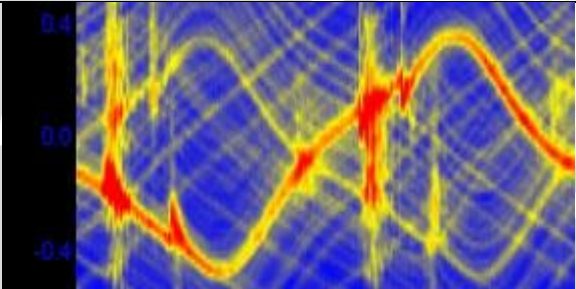
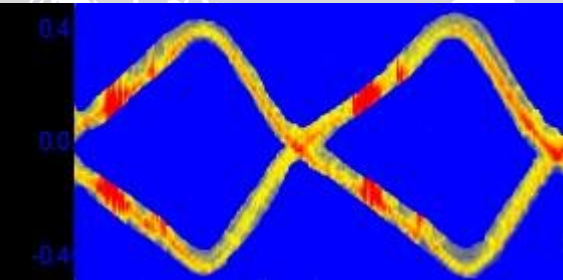
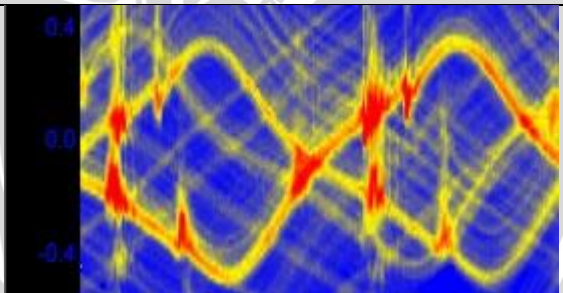
4) Tampilan Pola *Eye Pattern* pada 4 channel

No.	Diameter (mm)	Jumlah bengkokan	Pola <i>Eye Pattern</i>
1.	0	0	
2.	20	1	
		2	
		3	
		4	
		5	
3.	18	1	
		2	
		3	
		4	
		5	
4.	16	1	
		2	
		3	
		4	
		5	

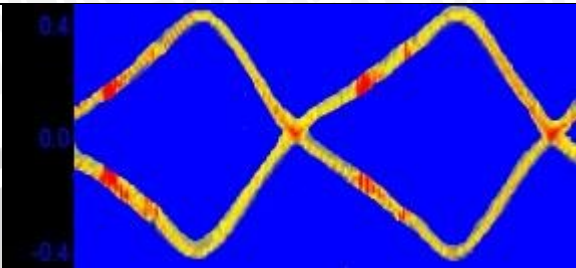
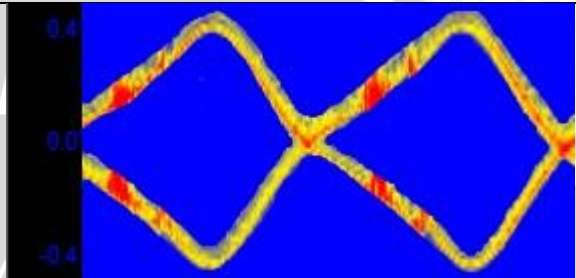
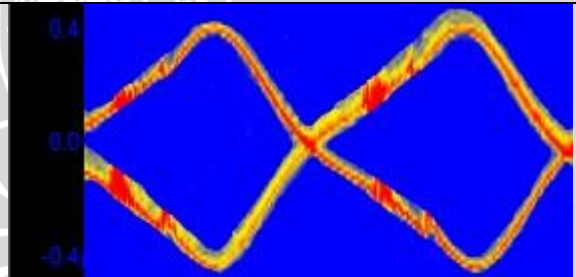
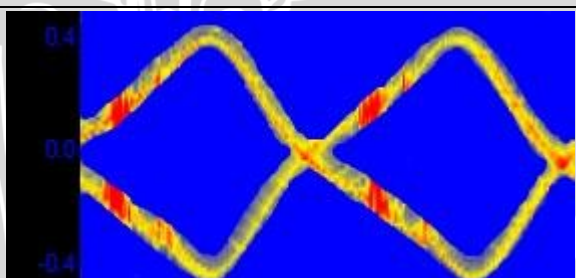
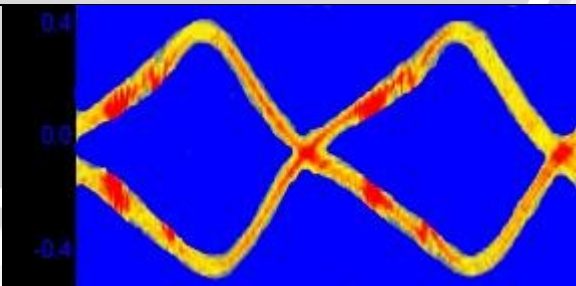
No.	Diameter (mm)	Jumlah bengkokan	Pola Eye Pattern
5.	14	1	
		2	
		3	
		4	
		5	
6.	12	1	
		2	
		3	
		4	
		5	

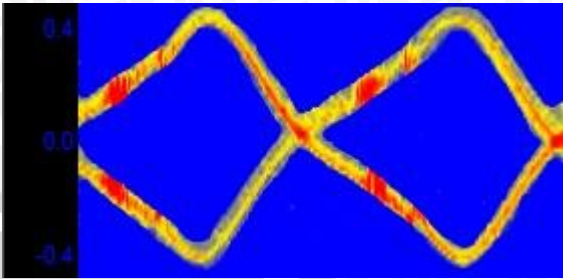
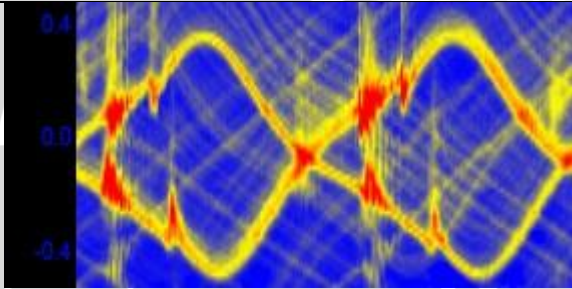
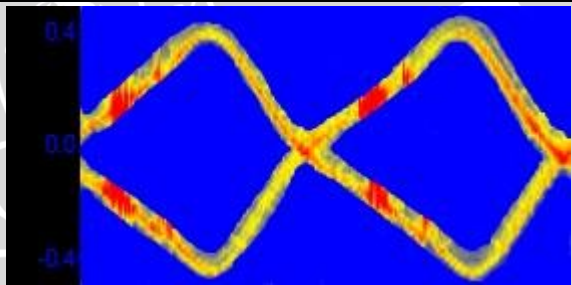
5) Tampilan Pola *Eye Pattern* pada 5 channel

No.	Diameter (mm)	Jumlah bengkokan	Pola <i>Eye Pattern</i>
1.	0	0	
2.	20	1	
		2	
		3	
		4	
		5	
3.	18	1	
		2	
		3	
		4	
		5	
4.	16	1	
		2	
		3	
		4	
		5	

No.	Diameter (mm)	Jumlah bengkokan	Pola Eye Pattern
5.	14	1	
		2	
		3	
		4	
		5	
6.	12	1	
		2	
		3	
		4	
		5	

6) Tampilan Pola *Eye Pattern* pada 6 channel

No.	Diameter (mm)	Jumlah bengkokan	Pola <i>Eye Pattern</i>
1.	0	0	
2.	20	1	
		2	
		3	
		4	
		5	
3.	18	1	
		2	
		3	
		4	
		5	
4.	16	1	
		2	
		3	
		4	
		5	

No.	Diameter (mm)	Jumlah bengkokan	Pola Eye Pattern
5.	14	1	
		2	
		3	
		4	
		5	
6.	12	1	
		2	
		3	
		4	
		5	