

# Bi-Directional Coupler

# SYBD-20-13HP+

## Typical Performance Data

TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = +25°C

FREQ. (MHz)	INSERTION LOSS (dB)		COUPLING (dB)		DIRECTIVITY (dB)		RETURN LOSS (dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
500	0.03	0.02	25.80	25.78	29.99	30.49	48.93	48.46	53.75	43.83
600	0.04	0.04	24.25	24.23	30.23	30.35	48.32	47.15	49.87	43.50
700	0.06	0.06	22.95	22.94	30.68	30.88	44.64	44.16	44.69	42.09
725	0.07	0.06	22.67	22.65	30.85	30.82	43.77	43.61	43.99	41.63
750	0.08	0.07	22.38	22.36	30.96	30.95	43.04	42.60	42.85	41.15
775	0.08	0.07	22.12	22.09	31.40	31.50	42.91	41.97	42.39	40.89
790	0.09	0.07	21.95	21.94	31.29	31.17	42.11	41.58	41.96	40.85
800	0.09	0.08	21.85	21.83	31.44	31.19	41.99	41.17	41.65	40.68
820	0.08	0.07	21.63	21.61	31.31	31.32	41.11	40.86	41.19	40.43
840	0.08	0.07	21.43	21.41	31.16	31.58	40.48	40.43	40.86	40.18
850	0.09	0.08	21.33	21.31	31.37	31.28	40.15	40.08	40.44	40.23
860	0.09	0.08	21.23	21.21	31.54	31.46	40.16	39.98	40.45	40.08
870	0.09	0.08	21.14	21.13	31.87	31.69	40.04	39.81	40.30	40.05
880	0.09	0.08	21.05	21.03	31.86	31.71	39.79	39.69	40.23	40.02
890	0.10	0.09	20.95	20.93	31.84	31.83	39.74	39.46	40.13	39.74
900	0.10	0.09	20.86	20.85	31.88	31.81	39.49	39.26	39.88	39.77
920	0.11	0.11	20.69	20.67	31.88	31.67	39.08	38.73	39.71	39.38
940	0.12	0.11	20.52	20.51	32.51	32.06	38.80	38.56	39.29	39.22
950	0.12	0.11	20.43	20.42	32.41	32.03	38.58	38.35	38.87	39.23
960	0.12	0.11	20.34	20.33	32.46	31.81	38.56	38.19	38.82	39.17
970	0.12	0.12	20.27	20.26	32.59	32.22	38.42	38.26	39.02	39.08
980	0.12	0.12	20.18	20.18	33.16	32.73	38.28	38.17	38.98	38.98
990	0.13	0.12	20.10	20.09	33.30	32.79	38.12	37.97	38.93	38.84
1000	0.13	0.12	20.02	20.00	33.22	32.88	37.97	37.94	38.79	38.75
1020	0.13	0.13	19.86	19.84	33.42	32.91	37.87	37.71	38.71	38.62
1040	0.14	0.13	19.70	19.69	33.83	33.17	37.74	37.60	38.62	38.48
1050	0.14	0.13	19.62	19.61	34.17	33.23	37.59	37.54	38.32	38.27
1100	0.15	0.14	19.24	19.21	33.90	33.15	37.32	37.21	38.07	38.08
1200	0.18	0.17	18.59	18.56	33.59	32.84	37.67	37.28	38.70	38.19
1300	0.19	0.19	17.96	17.94	36.74	34.59	38.12	38.08	39.35	39.67
1400	0.22	0.21	17.38	17.36	40.74	36.07	38.47	38.95	40.68	42.23
1500	0.24	0.22	16.90	16.88	41.54	36.00	39.04	41.87	43.13	48.52
1600	0.26	0.25	16.41	16.39	45.15	37.12	38.11	42.91	43.59	59.49
1700	0.29	0.28	15.94	15.93	46.74	39.51	35.76	40.96	42.02	48.28
1800	0.31	0.30	15.56	15.55	43.60	39.33	33.30	37.26	40.00	41.63
1900	0.35	0.34	15.21	15.19	48.16	39.34	31.32	34.55	38.62	39.03
2000	0.37	0.38	14.89	14.86	45.05	36.99	30.22	32.94	37.13	37.23
2100	0.39	0.36	14.55	14.54	36.00	46.05	29.41	32.20	35.62	35.73
2200	0.42	0.40	14.35	14.33	40.40	40.35	28.40	30.33	37.00	36.40
2300	0.44	0.43	14.06	14.05	37.13	42.26	28.77	30.36	38.80	38.10
2400	0.46	0.43	13.86	13.83	38.51	41.79	29.38	30.68	41.14	41.65
2500	0.46	0.46	13.58	13.59	34.54	61.18	30.50	32.05	47.46	51.78
2600	0.49	0.48	13.33	13.35	31.65	43.84	32.61	32.82	44.73	42.92
2700	0.52	0.51	13.13	13.13	28.75	34.92	33.97	32.08	37.88	36.06
2800	0.54	0.54	12.98	12.99	27.34	33.01	34.31	31.55	33.76	32.03
2900	0.56	0.55	12.81	12.81	26.23	30.88	32.21	29.68	30.40	29.54
3000	0.58	0.57	12.63	12.64	24.96	29.61	29.24	27.95	28.21	27.42
3500	0.69	0.67	12.02	11.96	20.24	21.51	22.79	22.83	23.18	23.64
4000	0.78	0.76	11.51	11.47	17.68	17.92	25.09	26.11	26.26	29.05
4500	0.84	0.84	11.35	11.37	16.67	15.74	31.00	39.72	34.00	37.17
5000	0.91	0.92	11.50	11.53	16.75	15.32	29.52	34.37	29.50	30.36
5500	0.97	0.96	11.93	12.03	13.91	14.53	34.91	34.97	29.87	31.29
6000	1.05	1.05	12.44	12.74	10.10	12.07	30.34	26.46	25.89	28.06

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# Bi-Directional Coupler

# SYBD-20-13HP+

## Typical Performance Data

TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = -55°C

FREQ. (MHz)	INSERTION LOSS		COUPLING		DIRECTIVITY		RETURN LOSS			
	(dB)		(dB)		(dB)		(dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
500	0.01	0.06	25.80	25.77	30.78	31.47	44.64	45.23	44.56	44.09
600	0.01	0.05	24.24	24.23	31.01	31.07	49.93	47.87	52.95	47.46
700	0.02	0.04	22.94	22.92	31.38	30.94	65.20	52.75	58.80	48.95
725	0.03	0.04	22.64	22.62	31.39	30.86	55.04	51.37	57.46	49.15
750	0.03	0.03	22.36	22.34	31.47	30.86	51.42	49.23	50.96	46.71
775	0.03	0.03	22.09	22.07	31.39	30.87	49.54	47.41	47.25	44.52
790	0.04	0.03	21.94	21.91	31.69	31.21	47.92	46.65	45.85	44.02
800	0.04	0.03	21.83	21.80	32.03	31.12	47.47	45.75	45.03	43.55
820	0.03	0.04	21.61	21.59	31.74	31.23	45.39	45.00	44.13	43.00
840	0.04	0.04	21.41	21.39	31.89	31.44	44.08	44.18	43.67	42.69
850	0.04	0.03	21.31	21.29	31.91	31.26	43.49	43.61	42.99	42.54
860	0.04	0.03	21.21	21.19	31.90	31.29	43.40	43.23	42.69	42.18
870	0.04	0.03	21.11	21.09	31.98	31.39	43.10	42.79	42.23	41.91
880	0.05	0.03	21.03	21.00	32.01	31.54	42.77	42.61	41.90	41.73
890	0.05	0.03	20.93	20.90	32.18	31.74	42.56	42.15	41.60	41.31
900	0.05	0.02	20.84	20.81	32.20	31.61	42.12	41.70	40.97	41.08
920	0.06	0.01	20.68	20.65	32.40	32.41	41.49	41.02	40.61	40.48
940	0.07	0.01	20.49	20.46	32.90	32.19	40.84	40.47	40.15	40.44
950	0.07	0.00	20.40	20.37	32.77	31.98	40.42	40.13	39.83	40.56
960	0.07	0.01	20.31	20.29	32.86	32.06	40.29	39.80	39.93	40.50
970	0.07	0.00	20.23	20.20	32.84	32.33	39.82	39.57	40.10	40.31
980	0.07	0.00	20.14	20.12	32.88	32.13	39.50	39.29	39.95	40.11
990	0.08	0.00	20.06	20.03	32.88	32.11	39.21	38.95	39.75	39.88
1000	0.08	0.00	19.97	19.95	32.59	32.21	38.90	38.79	39.40	39.65
1020	0.08	0.00	19.81	19.78	32.65	32.40	38.44	38.25	38.77	39.10
1040	0.09	0.00	19.64	19.62	32.65	31.80	37.89	37.63	37.95	38.39
1050	0.09	0.00	19.56	19.54	32.38	31.77	37.56	37.48	37.62	37.88
1100	0.10	0.01	19.19	19.17	32.29	31.62	36.77	36.72	37.16	37.37
1200	0.12	0.03	18.52	18.48	33.91	33.11	36.24	36.30	36.63	36.74
1300	0.13	0.04	17.93	17.90	36.76	34.67	37.28	37.62	35.46	36.10
1400	0.16	0.05	17.30	17.28	39.31	35.21	36.41	36.98	37.31	38.33
1500	0.18	0.06	16.84	16.80	39.66	34.74	36.30	38.18	40.98	44.05
1600	0.20	0.07	16.40	16.36	37.18	33.11	38.25	44.56	45.25	50.77
1700	0.22	0.10	15.89	15.86	42.51	36.66	38.54	49.42	45.19	44.51
1800	0.24	0.12	15.48	15.46	40.27	37.43	34.47	39.49	38.10	42.55
1900	0.27	0.14	15.07	15.02	40.20	44.51	31.34	35.11	37.69	39.38
2000	0.28	0.17	14.74	14.71	40.68	45.02	29.68	33.27	33.70	36.47
2100	0.31	0.17	14.45	14.41	33.59	50.81	28.80	32.07	32.02	33.72
2200	0.33	0.20	14.24	14.20	34.35	40.40	27.43	30.06	34.15	33.89
2300	0.34	0.20	13.91	13.92	32.00	42.41	27.01	29.63	35.22	34.94
2400	0.36	0.20	13.71	13.67	34.41	43.62	27.56	29.88	40.38	38.58
2500	0.36	0.23	13.47	13.47	36.32	51.82	28.69	31.27	40.19	50.58
2600	0.40	0.23	13.19	13.18	30.13	41.04	31.32	33.09	58.17	40.94
2700	0.47	0.34	12.86	12.89	23.23	26.35	34.37	31.05	29.93	29.54
2800	0.44	0.28	12.80	12.82	28.13	33.42	32.52	31.21	33.11	30.93
2900	0.46	0.29	12.64	12.62	25.90	30.98	32.25	29.57	29.68	28.71
3000	0.46	0.30	12.50	12.48	25.56	28.33	28.48	27.90	29.65	28.41
3500	0.58	0.38	11.84	11.76	19.94	21.38	22.49	22.32	23.02	23.48
4000	0.65	0.42	11.32	11.27	18.32	18.29	24.53	25.40	24.91	26.93
4500	0.70	0.48	11.05	11.06	16.87	15.78	29.68	40.09	35.74	35.88
5000	0.78	0.51	11.12	11.17	16.98	15.06	27.66	31.70	27.82	28.39
5500	0.79	0.54	11.68	11.75	13.74	14.24	32.42	39.63	25.24	25.91
6000	0.84	0.58	12.09	12.36	10.56	13.06	30.41	27.19	25.01	28.31

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# Bi-Directional Coupler

# SYBD-20-13HP+

## Typical Performance Data

TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = +100°C

FREQ. (MHz)	INSERTION LOSS (dB)		COUPLING (dB)		DIRECTIVITY (dB)		RETURN LOSS (dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
500	0.05	0.06	25.81	25.78	29.89	30.26	44.82	43.95	46.62	41.36
600	0.07	0.08	24.26	24.25	30.65	30.55	43.13	42.63	43.73	40.51
700	0.09	0.11	22.97	22.96	31.55	31.28	41.39	41.10	41.70	39.94
725	0.10	0.11	22.67	22.66	31.75	31.55	41.07	41.06	41.58	39.92
750	0.10	0.12	22.39	22.37	31.95	31.75	40.84	40.59	41.07	39.80
775	0.11	0.13	22.12	22.11	32.29	32.11	41.09	40.46	41.17	39.99
790	0.11	0.13	21.98	21.96	32.83	32.23	40.85	40.48	41.25	40.27
800	0.12	0.13	21.87	21.85	33.07	32.43	40.92	40.24	41.11	40.24
820	0.11	0.13	21.65	21.63	33.07	32.61	40.44	40.22	40.84	40.14
840	0.11	0.12	21.45	21.43	33.11	32.99	40.14	40.21	40.83	40.19
850	0.12	0.13	21.35	21.33	33.27	32.62	40.02	40.05	40.59	40.34
860	0.12	0.14	21.25	21.23	33.43	32.72	40.25	40.04	40.73	40.24
870	0.12	0.14	21.16	21.14	33.56	32.84	40.23	39.95	40.76	40.39
880	0.12	0.15	21.07	21.05	33.98	33.11	40.18	40.02	40.97	40.61
890	0.12	0.14	20.98	20.95	34.08	33.43	40.23	39.99	41.15	40.62
900	0.13	0.15	20.88	20.86	34.26	33.22	40.19	39.88	41.19	40.83
920	0.14	0.16	20.72	20.70	34.96	33.95	40.26	39.79	41.63	40.95
940	0.15	0.17	20.54	20.52	35.40	34.06	40.12	39.79	41.38	41.03
950	0.15	0.17	20.45	20.43	35.43	33.79	40.06	39.77	41.09	41.29
960	0.15	0.17	20.36	20.34	35.72	34.22	40.20	39.67	41.33	41.33
970	0.15	0.18	20.28	20.26	35.55	34.35	40.12	39.71	41.60	41.15
980	0.15	0.18	20.20	20.17	35.81	34.26	40.09	39.73	41.58	41.14
990	0.16	0.18	20.11	20.09	35.63	34.37	40.05	39.59	41.50	41.00
1000	0.16	0.18	20.03	20.01	35.68	34.56	40.06	39.69	41.37	41.04
1020	0.16	0.19	19.86	19.84	35.93	34.86	40.10	39.57	41.49	41.17
1040	0.18	0.19	19.70	19.69	36.40	34.35	40.22	39.52	41.56	41.12
1050	0.17	0.20	19.62	19.59	35.71	34.03	40.02	39.45	41.35	40.80
1100	0.19	0.21	19.25	19.23	35.94	34.40	40.57	39.60	42.06	41.74
1200	0.21	0.24	18.59	18.55	37.83	35.86	41.29	39.78	44.85	43.30
1300	0.23	0.26	18.00	17.98	46.28	39.75	41.99	41.47	48.40	48.42
1400	0.25	0.29	17.38	17.37	43.00	40.16	40.99	41.49	48.36	52.48
1500	0.28	0.31	16.92	16.89	55.33	41.61	39.70	41.95	48.04	59.07
1600	0.31	0.34	16.49	16.48	46.13	37.83	37.14	39.34	45.56	46.60
1700	0.33	0.37	16.00	15.98	42.90	43.98	35.09	37.26	43.54	47.39
1800	0.36	0.40	15.59	15.59	38.26	48.98	33.74	36.02	43.49	42.94
1900	0.39	0.43	15.18	15.15	33.82	41.43	32.82	35.45	43.54	44.55
2000	0.40	0.47	14.90	14.88	36.94	47.00	31.93	34.68	41.96	41.47
2100	0.44	0.49	14.61	14.59	34.79	41.07	31.61	33.40	46.56	42.64
2200	0.46	0.53	14.41	14.39	37.63	38.75	31.07	32.72	54.64	47.39
2300	0.48	0.54	14.12	14.10	37.44	43.41	32.14	33.23	56.71	57.49
2400	0.52	0.56	13.89	13.87	39.42	43.59	32.97	32.87	44.78	50.06
2500	0.52	0.60	13.69	13.69	37.04	36.62	33.54	33.64	42.27	41.56
2600	0.56	0.61	13.42	13.41	33.96	41.64	34.08	32.30	36.74	35.84
2700	0.62	0.71	13.36	13.42	26.83	27.44	36.75	30.58	37.47	34.20
2800	0.60	0.69	13.05	13.11	29.65	34.75	33.24	31.04	33.49	31.84
2900	0.63	0.71	12.88	12.90	27.54	31.82	31.37	29.52	30.53	29.78
3000	0.65	0.74	12.73	12.75	26.04	30.34	28.92	28.61	28.41	28.16
3500	0.78	0.88	12.15	12.08	21.35	22.64	23.73	24.33	24.43	25.36
4000	0.89	0.98	11.72	11.67	17.80	17.87	26.20	27.60	27.13	30.08
4500	0.99	1.12	11.51	11.56	16.87	15.83	33.72	33.73	44.14	41.07
5000	1.08	1.21	11.76	11.78	16.28	14.91	32.03	36.77	31.35	32.58
5500	1.16	1.30	12.25	12.36	13.28	13.39	33.05	29.83	28.88	31.47
6000	1.26	1.42	12.83	13.16	9.84	11.62	28.94	26.25	25.34	26.09

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