

Frequency Mixer

SYM-30DHW

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+14	+17	+20			+14	+17	+20			+14	+17	+20
10.1	40.1	6.59	6.11	5.92	10.1	40.1	28.61	29.46	27.84	10.1	40.1	0.99	0.52	0.31
110.1	140.1	7.08	6.46	6.16	110.1	140.1	22.94	24.43	24.28	110.1	140.1	0.71	0.39	0.24
210.1	240.1	7.09	6.49	6.19	210.1	240.1	22.39	22.60	24.42	210.1	240.1	0.76	0.42	0.26
310.1	340.1	7.31	6.65	6.26	310.1	340.1	20.61	22.35	26.45	310.1	340.1	0.68	0.41	0.30
410.1	440.1	7.35	6.63	6.25	410.1	440.1	21.15	24.97	30.14	410.1	440.1	0.71	0.49	0.38
510.1	540.1	7.54	6.72	6.31	510.1	540.1	20.95	25.75	30.65	510.1	540.1	0.66	0.55	0.43
610.1	640.1	7.55	6.69	6.30	610.1	640.1	22.21	27.11	29.33	610.1	640.1	0.76	0.64	0.48
710.1	740.1	7.60	6.74	6.35	710.1	740.1	22.63	26.29	27.81	710.1	740.1	0.78	0.65	0.51
810.1	840.1	7.49	6.74	6.38	810.1	840.1	23.88	25.76	26.65	810.1	840.1	0.83	0.63	0.48
910.1	940.1	7.49	6.76	6.41	910.1	940.1	24.12	25.56	25.79	910.1	940.1	0.81	0.63	0.51
1010.1	1040.1	7.31	6.70	6.39	1010.1	1040.1	25.16	24.77	24.79	1010.1	1040.1	0.85	0.57	0.45
1110.1	1140.1	7.17	6.59	6.29	1110.1	1140.1	24.24	24.02	24.11	1110.1	1140.1	0.84	0.55	0.44
1210.1	1240.1	7.06	6.50	6.24	1210.1	1240.1	23.11	24.08	24.42	1210.1	1240.1	0.85	0.49	0.38
1310.1	1340.1	6.99	6.44	6.19	1310.1	1340.1	22.81	23.88	24.67	1310.1	1340.1	0.85	0.45	0.34
1410.1	1440.1	6.97	6.39	6.14	1410.1	1440.1	23.10	23.66	24.80	1410.1	1440.1	0.85	0.42	0.29
1510.1	1540.1	7.16	6.49	6.22	1510.1	1540.1	25.04	24.07	24.71	1510.1	1540.1	0.74	0.38	0.24
1610.1	1640.1	7.31	6.60	6.28	1610.1	1640.1	28.02	26.34	25.53	1610.1	1640.1	0.68	0.34	0.23
1710.1	1740.1	7.49	6.74	6.39	1710.1	1740.1	30.00	27.95	26.87	1710.1	1740.1	0.66	0.35	0.24
1810.1	1840.1	7.66	6.87	6.49	1810.1	1840.1	27.40	28.45	27.71	1810.1	1840.1	0.67	0.40	0.28
1910.1	1940.1	7.79	6.99	6.60	1910.1	1940.1	26.81	28.73	26.92	1910.1	1940.1	0.68	0.42	0.31
2010.1	2040.1	7.83	7.05	6.61	2010.1	2040.1	26.99	27.73	26.27	2010.1	2040.1	0.61	0.42	0.33
2110.1	2140.1	7.96	7.11	6.70	2110.1	2140.1	27.41	26.97	26.13	2110.1	2140.1	0.62	0.45	0.36
2210.1	2240.1	7.98	7.11	6.70	2210.1	2240.1	26.23	25.26	25.08	2210.1	2240.1	0.77	0.54	0.46
2310.1	2340.1	7.99	7.15	6.72	2310.1	2340.1	23.76	23.76	24.15	2310.1	2340.1	0.84	0.61	0.49
2410.1	2440.1	7.95	7.14	6.73	2410.1	2440.1	21.80	22.25	22.99	2410.1	2440.1	0.91	0.68	0.56
2510.1	2540.1	7.82	7.03	6.63	2510.1	2540.1	20.77	21.32	22.12	2510.1	2540.1	1.03	0.77	0.63
2610.1	2640.1	7.76	6.96	6.61	2610.1	2640.1	19.97	20.56	21.46	2610.1	2640.1	1.07	0.77	0.65
2710.1	2740.1	7.73	6.96	6.65	2710.1	2740.1	19.41	20.17	21.04	2710.1	2740.1	1.12	0.77	0.62
2810.1	2840.1	7.72	7.02	6.71	2810.1	2840.1	18.82	19.73	20.87	2810.1	2840.1	1.16	0.84	0.65
2910.1	2940.1	7.85	7.18	6.85	2910.1	2940.1	18.47	19.58	20.78	2910.1	2940.1	1.19	0.81	0.62
3010.1	3040.1	8.10	7.39	7.07	3010.1	3040.1	18.13	19.43	20.67	3010.1	3040.1	1.23	0.75	0.59
3110.1	3140.1	8.32	7.71	7.35	3110.1	3140.1	18.57	19.82	21.15	3110.1	3140.1	1.19	0.73	0.56
3210.1	3240.1	8.67	8.09	7.76	3210.1	3240.1	19.07	20.46	21.62	3210.1	3240.1	1.11	0.64	0.50
3310.1	3340.1	9.17	8.59	8.24	3310.1	3340.1	19.90	21.26	22.55	3310.1	3340.1	1.04	0.56	0.44
3410.1	3440.1	9.67	9.16	8.82	3410.1	3440.1	20.98	22.05	23.54	3410.1	3440.1	0.96	0.46	0.37
3510.1	3540.1	10.23	9.71	9.35	3510.1	3540.1	22.44	22.80	24.61	3510.1	3540.1	0.97	0.37	0.30
3590.1	3620.1	10.74	10.25	9.86	3590.1	3620.1	23.93	23.38	25.43	3590.1	3620.1	0.96	0.32	0.25
3690.1	3720.1	11.42	10.86	10.42	3690.1	3720.1	23.60	23.91	26.04	3690.1	3720.1	0.97	0.25	0.20
3770.1	3800.1	11.94	11.28	10.79	3770.1	3800.1	21.78	24.67	25.82	3770.1	3800.1	1.02	0.24	0.19
3870.1	3900.1	12.69	11.89	11.34	3870.1	3900.1	21.33	26.41	25.62	3870.1	3900.1	0.86	0.18	0.14

Frequency Mixer

SYM-30DHW

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1501MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=3000.1001MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
1490.9	10.1	7.25	10.0	20.1	6.18	2990.0	10.1	8.42
1450.9	50.1	7.32	130.0	140.1	6.28	2910.0	90.1	8.36
1410.9	90.1	7.37	250.0	260.1	6.23	2830.0	170.1	8.33
1370.9	130.1	7.26	370.0	380.1	6.10	2750.0	250.1	8.21
1330.9	170.1	7.34	490.0	500.1	6.20	2670.0	330.1	8.13
1290.9	210.1	7.19	610.0	620.1	6.20	2590.0	410.1	8.10
1250.9	250.1	7.24	730.0	740.1	6.34	2510.0	490.1	8.15
1210.9	290.1	7.18	850.0	860.1	6.49	2430.0	570.1	8.17
1170.9	330.1	7.13	970.0	980.1	6.54	2350.0	650.1	8.14
1130.9	370.1	7.15	1070.0	1080.1	6.60	2270.0	730.1	8.08
1090.9	410.1	7.07	1190.0	1200.1	6.62	2190.0	810.1	8.01
1050.9	450.1	7.03	1290.0	1300.1	6.72	2110.0	890.1	7.96
1010.9	490.1	6.96	1410.0	1420.1	6.87	2030.0	970.1	7.98
970.9	530.1	6.98	1510.0	1520.1	7.01	1950.0	1050.1	7.81
930.9	570.1	6.93	1630.0	1640.1	7.31	1870.0	1130.1	7.74
890.9	610.1	6.83	1730.0	1740.1	7.44	1790.0	1210.1	7.65
850.9	650.1	6.89	1850.0	1860.1	7.64	1710.0	1290.1	7.55
810.9	690.1	6.79	1950.0	1960.1	7.75	1630.0	1370.1	7.44
770.9	730.1	6.71	2070.0	2080.1	7.88	1550.0	1450.1	7.30
730.9	770.1	6.65	2170.0	2180.1	7.97	1470.0	1530.1	7.20
690.9	810.1	6.66	2290.0	2300.1	7.94	1390.0	1610.1	7.30
650.9	850.1	6.62	2390.0	2400.1	7.99	1310.0	1690.1	7.29
610.9	890.1	6.55	2510.0	2520.1	8.01	1230.0	1770.1	7.31
570.9	930.1	6.55	2610.0	2620.1	7.94	1150.0	1850.1	7.27
530.9	970.1	6.48	2730.0	2740.1	7.94	1070.0	1930.1	7.26
490.9	1010.1	6.46	2830.0	2840.1	7.93	990.0	2010.1	7.17
450.9	1050.1	6.54	2950.0	2960.1	7.71	910.0	2090.1	7.16
410.9	1090.1	6.49	3050.0	3060.1	7.67	850.0	2150.1	7.11
370.9	1130.1	6.43	3170.0	3180.1	7.54	770.0	2230.1	6.99
330.9	1170.1	6.50	3270.0	3280.1	7.52	710.0	2290.1	6.97
290.9	1210.1	6.50	3390.0	3400.1	7.50	630.0	2370.1	6.88
250.9	1250.1	6.44	3490.0	3500.1	7.50	570.0	2430.1	6.88
210.9	1290.1	6.44	3610.0	3620.1	7.55	490.0	2510.1	6.82
190.9	1310.1	6.48	3710.0	3720.1	7.61	430.0	2570.1	6.87
150.9	1350.1	6.42	3830.0	3840.1	7.82	350.0	2650.1	6.82
130.9	1370.1	6.44	3930.0	3940.1	7.89	290.0	2710.1	6.92
90.9	1410.1	6.39	4050.0	4060.1	8.10	210.0	2790.1	6.93
70.9	1430.1	6.40	4150.0	4160.1	8.24	150.0	2850.1	7.05
30.9	1470.1	6.45	4270.0	4280.1	8.55	70.0	2930.1	7.09
10.9	1490.1	6.43	4370.0	4380.1	8.99	10.0	2990.1	7.29

Frequency Mixer

SYM-30DHW

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
40.1	31.04	33.56	36.31	39.40	43.23	46.76
140.1	32.04	35.13	38.29	39.92	44.10	47.07
240.1	32.62	35.75	38.88	40.39	44.44	46.17
340.1	32.98	36.02	39.10	40.86	44.59	44.63
440.1	33.21	36.30	39.65	42.11	44.11	43.33
540.1	33.93	37.38	40.95	43.13	44.11	42.60
640.1	34.78	38.76	42.27	43.23	42.69	41.24
740.1	36.23	41.09	43.71	44.14	43.29	41.03
840.1	37.90	42.29	42.38	44.30	41.94	40.17
940.1	39.34	42.79	40.39	44.72	41.97	39.94
1040.1	41.09	43.14	38.89	46.41	43.36	40.59
1140.1	44.48	44.17	38.11	52.01	46.25	41.58
1240.1	48.48	42.46	37.10	61.90	47.64	42.02
1340.1	46.32	40.51	36.55	68.10	47.47	42.16
1440.1	44.46	39.04	35.68	58.97	48.40	42.72
1540.1	44.91	38.67	35.46	54.86	49.68	43.57
1640.1	44.43	38.38	35.50	52.31	50.65	44.92
1740.1	43.12	38.19	35.82	50.84	50.43	45.16
1840.1	41.68	38.03	36.33	50.33	50.56	46.04
1940.1	40.13	37.81	36.97	50.21	51.09	46.98
2040.1	38.61	37.32	37.12	50.66	51.34	47.67
2140.1	37.88	37.05	37.34	51.65	53.64	48.03
2240.1	37.07	36.20	36.57	51.95	57.04	48.81
2340.1	35.94	35.10	35.35	51.50	63.68	48.18
2440.1	34.04	33.47	33.88	51.16	57.69	46.78
2540.1	32.58	32.27	32.95	50.96	52.14	44.55
2640.1	31.14	31.11	32.19	51.48	47.18	42.33
2740.1	30.08	30.58	31.96	53.95	44.70	40.80
2840.1	28.78	30.03	31.73	50.54	41.47	38.12
2940.1	27.76	29.36	31.35	46.40	39.67	36.41
3040.1	26.71	28.50	30.93	42.31	37.49	35.44
3140.1	25.79	27.89	30.43	38.47	35.80	33.81
3240.1	25.39	27.63	30.27	35.71	34.38	32.92
3340.1	25.05	27.24	29.90	33.57	32.90	32.20
3440.1	24.90	26.99	29.46	31.68	31.63	31.27
3540.1	24.50	26.45	28.71	29.90	30.25	30.42
3620.1	24.13	26.00	28.03	28.79	29.43	29.63
3720.1	23.94	25.59	27.37	27.69	28.36	28.75
3800.1	23.71	25.18	26.76	26.90	27.68	28.17
3900.1	23.58	24.81	26.00	26.22	27.09	27.52

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	32.66	32.47	32.16
110.1	140.1	32.80	33.01	33.08
210.1	240.1	33.28	34.01	34.55
310.1	340.1	34.57	35.56	36.45
410.1	440.1	36.04	36.93	37.99
510.1	540.1	37.03	37.87	38.51
610.1	640.1	38.54	39.48	39.87
710.1	740.1	41.14	41.95	42.03
810.1	840.1	44.57	44.95	44.98
910.1	940.1	49.75	52.15	53.91
1010.1	1040.1	54.40	54.72	57.27
1110.1	1140.1	49.85	48.95	50.35
1210.1	1240.1	46.90	46.27	47.61
1310.1	1340.1	47.18	47.81	49.12
1410.1	1440.1	50.23	50.62	52.34
1510.1	1540.1	58.15	51.60	50.42
1610.1	1640.1	50.53	46.70	43.51
1710.1	1740.1	44.54	42.91	40.47
1810.1	1840.1	41.81	42.10	41.03
1910.1	1940.1	41.30	42.32	42.70
2010.1	2040.1	41.43	41.41	41.29
2110.1	2140.1	41.39	40.44	39.60
2210.1	2240.1	39.86	39.39	38.29
2310.1	2340.1	38.41	37.96	37.23
2410.1	2440.1	37.06	36.81	36.47
2510.1	2540.1	35.66	35.50	35.27
2610.1	2640.1	34.67	34.60	34.43
2710.1	2740.1	34.01	34.14	34.47
2810.1	2840.1	33.18	33.09	33.41
2910.1	2940.1	32.14	32.01	32.21
3010.1	3040.1	30.88	30.76	30.81
3110.1	3140.1	29.62	29.37	29.38
3210.1	3240.1	28.35	27.95	27.86
3310.1	3340.1	27.10	26.66	26.44
3410.1	3440.1	26.01	25.60	25.34
3510.1	3540.1	25.27	24.99	24.79
3590.1	3620.1	24.44	24.36	24.29
3690.1	3720.1	23.39	23.64	23.89
3770.1	3800.1	22.80	23.38	23.84
3870.1	3900.1	22.59	23.52	24.32

Frequency Mixer

SYM-30DHW

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=3000MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
10.1	40.1	1.19	1.17	1.18	40.1	1.12	2.39	5.95	10.0	2.06	1.77	1.58
110.1	140.1	1.21	1.07	1.02	140.1	1.12	1.74	2.69	90.0	2.06	1.77	1.58
210.1	240.1	1.23	1.09	1.02	240.1	1.15	1.65	2.46	170.0	2.10	1.79	1.60
310.1	340.1	1.30	1.16	1.09	340.1	1.23	1.63	2.35	250.0	2.07	1.76	1.56
410.1	440.1	1.35	1.22	1.15	440.1	1.27	1.59	2.27	330.0	2.03	1.71	1.51
510.1	540.1	1.49	1.35	1.27	540.1	1.38	1.59	2.22	410.0	2.04	1.72	1.51
610.1	640.1	1.63	1.47	1.39	640.1	1.41	1.54	2.13	490.0	2.09	1.76	1.54
710.1	740.1	1.75	1.59	1.49	740.1	1.52	1.55	2.07	570.0	2.06	1.73	1.51
810.1	840.1	1.86	1.70	1.60	840.1	1.59	1.53	1.99	650.0	1.98	1.66	1.45
910.1	940.1	1.97	1.79	1.69	940.1	1.69	1.54	1.91	730.0	1.92	1.61	1.41
1010.1	1040.1	2.02	1.85	1.75	1040.1	1.77	1.50	1.81	810.0	1.84	1.54	1.36
1110.1	1140.1	2.06	1.88	1.77	1140.1	1.86	1.50	1.74	890.0	1.78	1.50	1.34
1210.1	1240.1	2.07	1.88	1.77	1240.1	1.94	1.49	1.66	970.0	1.74	1.49	1.35
1310.1	1340.1	2.02	1.82	1.71	1340.1	1.97	1.47	1.59	1050.0	1.71	1.48	1.36
1410.1	1440.1	1.97	1.76	1.64	1440.1	2.01	1.46	1.54	1130.0	1.64	1.44	1.35
1510.1	1540.1	1.94	1.70	1.57	1540.1	1.97	1.44	1.49	1210.0	1.62	1.46	1.41
1610.1	1640.1	1.87	1.64	1.49	1640.1	1.94	1.41	1.45	1290.0	1.63	1.51	1.47
1710.1	1740.1	1.84	1.62	1.47	1740.1	1.89	1.37	1.41	1370.0	1.65	1.54	1.52
1810.1	1840.1	1.80	1.58	1.45	1840.1	1.83	1.31	1.38	1450.0	1.67	1.60	1.60
1910.1	1940.1	1.77	1.57	1.43	1940.1	1.77	1.27	1.35	1530.0	1.75	1.70	1.72
2010.1	2040.1	1.75	1.56	1.42	2040.1	1.72	1.22	1.33	1610.0	1.82	1.78	1.80
2110.1	2140.1	1.73	1.54	1.42	2140.1	1.68	1.18	1.31	1690.0	1.90	1.87	1.90
2210.1	2240.1	1.73	1.54	1.43	2240.1	1.65	1.16	1.30	1770.0	2.04	2.03	2.06
2310.1	2340.1	1.70	1.52	1.40	2340.1	1.62	1.13	1.30	1850.0	2.20	2.17	2.19
2410.1	2440.1	1.68	1.51	1.40	2440.1	1.58	1.10	1.31	1930.0	2.29	2.25	2.27
2510.1	2540.1	1.64	1.47	1.35	2540.1	1.53	1.06	1.34	2010.0	2.44	2.41	2.42
2610.1	2640.1	1.53	1.35	1.25	2640.1	1.46	1.04	1.39	2090.0	2.62	2.57	2.57
2710.1	2740.1	1.38	1.21	1.12	2740.1	1.38	1.07	1.46	2150.0	2.75	2.68	2.68
2810.1	2840.1	1.20	1.06	1.04	2840.1	1.28	1.14	1.55	2230.0	2.89	2.82	2.80
2910.1	2940.1	1.04	1.09	1.20	2940.1	1.17	1.24	1.66	2290.0	2.88	2.79	2.77
3010.1	3040.1	1.14	1.29	1.41	3040.1	1.05	1.36	1.80	2370.0	3.03	2.92	2.87
3110.1	3140.1	1.37	1.52	1.67	3140.1	1.08	1.49	1.96	2430.0	3.02	2.89	2.85
3210.1	3240.1	1.63	1.79	1.94	3240.1	1.22	1.64	2.13	2510.0	3.03	2.88	2.81
3310.1	3340.1	1.89	2.04	2.17	3340.1	1.39	1.81	2.31	2570.0	2.98	2.82	2.76
3410.1	3440.1	2.18	2.31	2.40	3440.1	1.58	1.99	2.49	2650.0	2.95	2.77	2.68
3510.1	3540.1	2.44	2.55	2.61	3540.1	1.80	2.18	2.68	2710.0	2.90	2.72	2.63
3590.1	3620.1	2.58	2.66	2.71	3620.1	1.98	2.34	2.82	2790.0	2.79	2.60	2.50
3690.1	3720.1	2.77	2.83	2.88	3720.1	2.25	2.56	3.00	2850.0	2.71	2.53	2.44
3770.1	3800.1	2.85	2.89	2.95	3800.1	2.46	2.70	3.07	2930.0	2.59	2.41	2.30
3870.1	3900.1	2.97	3.00	3.08	3900.1	2.80	2.95	3.27	2990.0	2.56	2.38	2.28

Frequency Mixer

SYM-30DHW

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
		0	1	2	3	4	5	6	7	8	9	10
0	-	-	26	10	28	18	28	33	31	53	34	52
1	-	45	+0	36	14	55	25	36	47	33	42	40
2	68	59	63	63	66	54	58	66	60	69	56	62
3	>100	77	60	80	60	78	67	78	71	69	74	62
4	>100	>93	>93	>93	>93	>93	>93	>93	>93	92	92	>93
5	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
6	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
7	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93

Test conditions: RF IN: 1502.5 MHz; -1.00 dBm.
 LO IN: 1532.5 MHz; +17.00 dBm
 IF OUT: 30 MHz; -7.43 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
		0	1	2	3	4	5	6	7	8	9	10
0	-	-	34	20	41	29	41	49	48	63	56	69
1	-	46	+0	37	14	58	26	41	51	42	51	59
2	48	46	51	50	54	46	48	50	53	60	53	60
3	95	59	40	67	42	60	53	63	53	52	62	47
4	>100	71	68	66	76	61	72	56	73	64	72	75
5	>100	78	70	80	60	85	56	76	57	73	63	70
6	>100	96	86	91	83	78	89	77	94	77	77	82
7	>100	88	92	98	84	90	79	90	75	90	88	91
8	>100	>103	101	>103	101	92	93	89	93	88	88	93
9	>100	>103	>103	94	>103	103	>103	101	94	>103	85	>103
10	>100	>103	>103	>103	>103	>103	>103	>103	>103	97	>103	91

LO HARMONICS ORDER

Test conditions: RF IN: 1502.5 MHz; 9.00 dBm.
 LO IN: 1532.5 MHz; +17.00 dBm
 IF OUT: 30 MHz; 2.53 dBm

- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
 2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
 3. RF Cal represent the Harmonics level of the RF input signal to the mixer.