

# Frequency Mixer

# ADE-1LH+

## 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=+5dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+7	+10	+13			+7	+10	+13			+7	+10	+13
0.5	30.5	6.21	5.87	5.70	10.1	40.1	25.05	32.61	26.45	10.1	40.1	1.49	1.18	0.94
0.8	30.8	6.02	5.68	5.52	30.1	60.1	22.60	27.70	25.25	30.1	60.1	1.54	1.29	1.04
1.0	31.0	5.86	5.70	5.53	50.1	80.1	24.73	26.00	24.27	50.1	80.1	1.62	1.25	1.06
5.0	35.0	5.37	5.21	5.04	70.1	100.1	23.25	24.38	24.45	70.1	100.1	1.70	1.31	1.08
10.0	40.0	5.42	5.08	5.08	90.1	120.1	21.94	24.86	19.49	90.1	120.1	1.61	1.27	1.04
30.1	60.1	5.21	4.97	4.81	110.1	140.1	23.72	20.80	17.79	110.1	140.1	1.61	1.21	1.00
50.1	80.1	5.19	4.98	4.84	130.1	160.1	22.16	19.60	16.78	130.1	160.1	1.49	1.23	1.04
70.1	100.1	5.18	4.98	4.84	150.1	180.1	20.89	15.81	14.59	150.1	180.1	1.70	1.20	1.02
90.1	120.1	5.23	5.01	4.87	170.1	200.1	21.47	19.54	17.48	170.1	200.1	1.41	1.14	0.93
130.1	160.1	5.29	5.11	4.97	190.1	220.1	15.99	14.44	15.43	190.1	220.1	1.48	1.16	0.97
150.1	180.1	5.33	5.15	5.01	210.1	240.1	14.02	12.69	12.65	210.1	240.1	1.52	1.14	0.95
170.1	200.1	5.36	5.17	5.02	230.1	260.1	15.29	14.05	14.03	230.1	260.1	1.50	1.14	0.92
190.1	220.1	5.38	5.20	5.04	250.1	280.1	15.88	15.45	17.13	250.1	280.1	1.35	1.14	0.93
210.1	240.1	5.34	5.18	5.05	270.1	300.1	12.47	12.89	16.55	270.1	300.1	1.24	1.09	0.96
230.1	260.1	5.40	5.20	5.04	290.1	320.1	13.55	12.59	12.91	290.1	320.1	1.13	1.04	0.90
250.1	280.1	5.50	5.21	5.01	310.1	340.1	15.07	14.80	15.71	310.1	340.1	1.34	1.10	0.92
270.1	300.1	5.66	5.38	5.10	330.1	360.1	15.81	15.86	15.32	330.1	360.1	1.53	1.23	1.05
290.1	320.1	5.69	5.50	5.27	350.1	380.1	15.10	13.68	16.03	350.1	380.1	1.85	1.44	1.14
330.1	360.1	5.67	5.48	5.27	370.1	400.1	14.00	14.69	17.04	370.1	400.1	1.94	1.48	1.25
350.1	380.1	5.61	5.37	5.19	390.1	420.1	14.58	15.51	17.21	390.1	420.1	1.99	1.63	1.39
370.1	400.1	5.63	5.37	5.22	410.1	440.1	14.29	16.45	18.28	410.1	440.1	2.37	1.75	1.59
390.1	420.1	5.68	5.45	5.30	430.1	460.1	9.01	14.74	18.75	430.1	460.1	2.25	2.03	1.70
410.1	440.1	5.87	5.53	5.35	450.1	480.1	5.96	9.68	15.89	450.1	480.1	2.42	2.11	1.86
430.1	460.1	6.15	5.65	5.38	470.1	500.1	4.76	6.66	10.79	470.1	500.1	2.24	2.17	2.03
450.1	480.1	6.48	5.96	5.51	510.1	540.1	4.44	5.34	6.81	510.1	540.1	2.31	2.13	2.04
470.1	500.1	6.66	6.23	5.66	530.1	560.1	4.75	5.55	6.51	530.1	560.1	2.40	2.17	2.11
530.1	560.1	7.18	6.68	6.13	570.1	600.1	5.88	7.04	9.49	570.1	600.1	2.23	2.16	1.99
570.1	600.1	7.35	6.59	6.02	590.1	620.1	7.18	9.25	13.53	590.1	620.1	2.24	2.14	1.98
590.1	620.1	7.25	6.51	5.89	630.1	660.1	11.07	15.91	17.14	630.1	660.1	2.27	2.18	2.06
630.1	660.1	6.99	6.29	5.77	650.1	680.1	13.13	20.45	15.58	650.1	680.1	2.40	2.18	2.02
650.1	680.1	6.85	6.21	5.82	690.1	720.1	14.17	18.02	15.87	690.1	720.1	2.45	2.09	1.91
690.1	720.1	6.73	6.34	6.07	710.1	740.1	14.06	17.51	17.38	710.1	740.1	2.30	1.95	1.75
710.1	740.1	6.84	6.51	6.28	750.1	780.1	14.02	15.13	16.95	750.1	780.1	2.31	1.87	1.64
750.1	780.1	7.06	6.79	6.61	770.1	800.1	13.11	14.12	16.28	770.1	800.1	1.83	1.66	1.48
770.1	800.1	7.28	7.01	6.83	810.1	840.1	11.42	12.39	14.44	810.1	840.1	1.82	1.64	1.44
830.1	860.1	7.94	7.73	7.64	830.1	860.1	11.05	11.94	14.93	830.1	860.1	1.81	1.56	1.36
870.1	900.1	8.57	8.41	8.31	870.1	900.1	11.16	13.07	16.76	870.1	900.1	1.82	1.51	1.29
890.1	920.1	8.95	8.78	8.67	890.1	920.1	11.55	13.76	17.32	890.1	920.1	1.89	1.50	1.29
930.1	960.1	9.84	9.61	9.43	930.1	960.1	12.67	15.27	17.62	930.1	960.1	1.69	1.38	1.30
950.1	980.1	10.31	10.02	9.85	950.1	980.1	13.30	16.38	17.54	950.1	980.1	2.06	1.37	1.37

# Frequency Mixer

# ADE-1LH+

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (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)=500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+10			+10			+10
240.0	10.1	5.25	10.0	20.1	4.93	490.0	10.1	5.95
234.1	16.0	5.20	22.3	32.4	4.76	477.7	22.4	5.85
228.2	21.9	5.16	34.6	44.7	4.75	465.4	34.7	5.79
222.3	27.8	5.14	46.9	57.0	4.77	453.1	47.0	5.76
216.4	33.7	5.13	59.2	69.3	4.79	440.8	59.3	5.77
210.5	39.6	5.10	71.5	81.6	4.81	428.5	71.6	5.72
204.6	45.5	5.10	83.8	93.9	4.82	416.2	83.9	5.67
198.7	51.4	5.07	96.2	106.3	4.83	403.8	96.3	5.65
192.8	57.3	5.04	108.5	118.6	4.84	391.5	108.6	5.64
186.9	63.2	5.01	120.8	130.9	4.83	379.2	120.9	5.68
181.0	69.1	5.03	133.1	143.2	4.85	366.9	133.2	5.71
175.1	75.0	5.04	145.4	155.5	4.89	354.6	145.5	5.67
169.2	80.9	5.04	157.7	167.8	4.90	342.3	157.8	5.68
163.3	86.8	5.03	170.0	180.1	4.93	330.0	170.1	5.68
157.4	92.7	5.03	182.3	192.4	4.94	317.7	182.4	5.71
151.5	98.6	5.03	194.6	204.7	4.93	305.4	194.7	5.76
145.6	104.5	5.05	206.9	217.0	4.97	293.1	207.0	5.76
139.7	110.4	5.04	219.2	229.3	5.01	280.8	219.3	5.76
133.8	116.3	5.03	231.5	241.6	4.97	268.5	231.6	5.81
127.9	122.2	5.02	243.8	253.9	4.95	256.2	243.9	5.84
122.1	128.0	5.02	256.2	266.3	4.93	243.8	256.3	5.88
116.2	133.9	5.05	268.5	278.6	4.91	231.5	268.6	5.87
110.3	139.8	5.08	280.8	290.9	4.99	219.2	280.9	5.83
104.4	145.7	5.07	293.1	303.2	5.11	206.9	293.2	5.85
98.5	151.6	5.07	305.4	315.5	5.21	194.6	305.5	5.85
92.6	157.5	5.08	317.7	327.8	5.32	182.3	317.8	5.84
86.7	163.4	5.10	330.0	340.1	5.34	170.0	330.1	5.86
80.8	169.3	5.11	342.3	352.4	5.35	157.7	342.4	5.86
74.9	175.2	5.11	354.6	364.7	5.34	145.4	354.7	5.87
69.0	181.1	5.10	366.9	377.0	5.27	133.1	367.0	5.82
63.1	187.0	5.08	379.2	389.3	5.22	120.8	379.3	5.71
57.2	192.9	5.09	391.5	401.6	5.14	108.5	391.6	5.68
51.3	198.8	5.10	403.8	413.9	5.10	96.2	403.9	5.66
45.4	204.7	5.13	416.2	426.3	5.11	83.8	416.3	5.63
39.5	210.6	5.14	428.5	438.6	5.08	71.5	428.6	5.61
33.6	216.5	5.16	440.8	450.9	5.11	59.2	440.9	5.62
27.7	222.4	5.16	453.1	463.2	5.10	46.9	453.2	5.63
21.8	228.3	5.19	465.4	475.5	5.14	34.6	465.5	5.76
15.9	234.2	5.23	477.7	487.8	5.23	22.3	477.8	5.94
10.0	240.1	5.36	490.0	500.1	5.27	10.0	490.1	6.05

# Frequency Mixer

# ADE-1LH+

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+7	+10	+13	+7	+10	+13
0.5	64.67	67.00	68.67	54.67	52.50	50.99
0.8	64.67	66.83	68.67	54.17	52.17	50.83
1.0	64.84	67.01	68.67	54.00	52.00	50.66
5.0	63.34	65.67	67.34	52.50	50.33	49.16
10.0	62.17	64.17	66.17	52.67	50.17	48.66
30.1	63.35	65.13	66.38	64.27	60.27	57.87
50.1	59.42	60.71	62.44	61.45	55.82	53.86
70.1	56.14	58.15	59.71	57.32	52.81	50.99
90.1	54.38	56.33	58.10	53.77	50.31	48.85
130.1	51.95	54.18	55.89	48.59	47.00	46.07
150.1	51.06	52.87	54.39	47.41	46.03	45.07
170.1	50.53	52.70	54.39	46.58	45.36	44.47
190.1	49.34	51.46	53.26	45.32	44.50	43.75
210.1	48.31	50.24	51.78	45.20	44.00	42.67
230.1	48.22	50.10	51.60	44.77	43.80	42.16
250.1	48.13	49.86	51.14	44.90	43.70	42.10
270.1	48.46	50.62	52.31	44.82	43.10	41.11
290.1	47.13	49.63	51.55	45.66	43.07	40.38
330.1	44.92	46.85	48.76	41.25	39.95	38.59
350.1	43.66	45.62	47.55	40.09	38.76	37.52
370.1	42.67	44.29	45.97	38.21	36.66	35.22
390.1	41.64	43.67	45.92	36.38	34.52	33.17
410.1	41.31	43.50	45.23	35.08	32.65	31.34
430.1	41.68	44.08	45.89	34.89	31.55	30.01
450.1	41.29	44.11	45.91	37.20	31.37	29.55
470.1	40.48	43.88	46.19	42.24	31.86	29.18
530.1	42.23	46.18	47.80	40.13	34.63	30.29
570.1	42.24	44.15	41.95	38.62	33.46	29.07
590.1	41.26	41.37	38.97	37.92	31.66	26.70
630.1	38.82	36.64	34.35	35.07	26.69	22.64
650.1	37.50	35.02	33.29	32.21	25.14	22.06
690.1	35.30	33.43	31.93	28.38	23.83	21.39
710.1	34.78	32.50	30.95	27.54	23.05	20.91
750.1	34.44	31.24	28.83	25.55	22.17	19.79
770.1	34.19	30.19	27.91	24.41	21.20	19.06
830.1	30.71	26.72	24.61	21.39	19.34	17.64
870.1	27.81	24.53	22.60	19.97	18.59	17.07
890.1	26.09	23.42	21.53	19.04	18.13	16.63
930.1	23.77	21.66	19.83	17.81	17.41	16.03
950.1	22.79	20.85	19.17	17.23	17.09	15.81

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+7	+10	+13
10.1	40.1	41.82	43.86	43.79
30.1	60.1	35.97	36.22	36.37
50.1	80.1	31.91	32.07	32.46
70.1	100.1	29.44	29.67	29.78
90.1	120.1	27.53	27.85	28.07
110.1	140.1	26.31	26.69	26.85
130.1	160.1	25.26	25.54	25.78
150.1	180.1	24.68	24.84	25.10
170.1	200.1	24.47	24.70	24.92
190.1	220.1	23.87	24.51	24.94
210.1	240.1	23.54	23.88	24.35
230.1	260.1	23.50	23.94	24.39
250.1	280.1	23.47	23.97	24.45
270.1	300.1	23.37	23.73	24.18
290.1	320.1	24.06	24.42	24.78
310.1	340.1	24.09	24.61	24.95
330.1	360.1	24.04	24.53	25.25
350.1	380.1	22.76	23.63	24.18
370.1	400.1	21.36	21.82	22.14
390.1	420.1	20.03	20.26	20.46
410.1	440.1	18.46	18.60	18.71
430.1	460.1	17.61	17.56	17.64
450.1	480.1	17.13	17.08	17.11
470.1	500.1	16.67	16.56	16.56
510.1	540.1	16.57	16.61	16.75
530.1	560.1	16.85	16.97	17.26
570.1	600.1	18.11	18.38	18.65
590.1	620.1	18.54	18.52	18.53
630.1	660.1	17.67	17.17	16.78
650.1	680.1	16.77	16.23	15.80
690.1	720.1	14.80	14.31	13.91
710.1	740.1	13.94	13.43	13.06
750.1	780.1	12.24	11.80	11.35
770.1	800.1	11.43	10.99	10.53
810.1	840.1	9.97	9.53	9.08
830.1	860.1	9.27	8.86	8.47
870.1	900.1	7.96	7.53	7.18
890.1	920.1	7.36	6.96	6.59
930.1	960.1	6.30	5.90	5.58
950.1	980.1	5.86	5.43	5.17

# Frequency Mixer

# ADE-1LH+

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+7	+10	+13		+7	+10	+13		+7	+10	+13
0.5	30.5	1.58	1.54	1.51	0.5	1.65	2.56	3.81	0.1	3.01	2.46	1.95
0.8	30.8	1.42	1.37	1.35	0.8	1.65	2.56	3.81	0.3	2.93	2.36	1.90
1.0	31.0	1.39	1.33	1.30	1.0	1.69	2.61	3.81	0.5	3.00	2.41	1.95
5.0	35.0	1.33	1.23	1.16	5.0	1.65	2.61	3.95	1.0	3.09	2.46	1.98
10.0	40.0	1.33	1.22	1.15	10.0	1.69	2.67	3.95	5.0	2.93	2.41	1.92
30.1	60.1	1.26	1.15	1.09	30.1	1.62	2.44	3.50	10.0	2.93	2.37	1.90
50.1	80.1	1.26	1.15	1.08	50.1	1.61	2.42	3.42	22.4	2.92	2.24	1.71
70.1	100.1	1.24	1.14	1.08	70.1	1.57	2.33	3.28	34.7	2.61	2.08	1.60
90.1	120.1	1.24	1.13	1.07	90.1	1.56	2.30	3.24	47.0	2.72	2.11	1.65
110.1	140.1	1.21	1.12	1.06	110.1	1.57	2.34	3.28	59.3	2.71	2.12	1.64
130.1	160.1	1.21	1.11	1.06	130.1	1.60	2.39	3.35	71.6	2.69	2.12	1.64
150.1	180.1	1.20	1.12	1.07	150.1	1.60	2.37	3.30	83.9	2.69	2.14	1.66
170.1	200.1	1.16	1.08	1.03	170.1	1.60	2.34	3.25	96.3	2.65	2.12	1.64
190.1	220.1	1.17	1.08	1.03	190.1	1.61	2.36	3.26	108.6	2.61	2.10	1.64
210.1	240.1	1.15	1.08	1.05	210.1	1.66	2.42	3.36	120.9	2.68	2.15	1.69
230.1	260.1	1.14	1.07	1.05	230.1	1.69	2.46	3.42	133.2	2.69	2.16	1.71
250.1	280.1	1.14	1.06	1.04	250.1	1.70	2.45	3.37	145.5	2.68	2.16	1.71
270.1	300.1	1.15	1.07	1.04	270.1	1.72	2.45	3.34	157.8	2.62	2.13	1.68
290.1	320.1	1.12	1.05	1.02	290.1	1.76	2.51	3.43	170.1	2.62	2.13	1.68
310.1	340.1	1.07	1.02	1.04	310.1	1.81	2.59	3.56	182.4	2.63	2.14	1.70
330.1	360.1	1.03	1.04	1.11	330.1	1.84	2.62	3.60	194.7	2.64	2.18	1.74
350.1	380.1	1.04	1.12	1.19	350.1	1.84	2.60	3.54	207.0	2.63	2.17	1.75
370.1	400.1	1.09	1.16	1.21	370.1	1.83	2.57	3.50	219.3	2.60	2.15	1.74
390.1	420.1	1.10	1.17	1.21	390.1	1.87	2.60	3.55	231.6	2.55	2.10	1.71
410.1	440.1	1.09	1.15	1.18	410.1	1.95	2.69	3.65	243.9	2.52	2.08	1.71
430.1	460.1	1.10	1.11	1.14	430.1	2.07	2.79	3.73	268.6	2.56	2.13	1.75
450.1	480.1	1.16	1.10	1.10	450.1	2.15	2.86	3.76	280.9	2.53	2.12	1.75
470.1	500.1	1.22	1.14	1.08	470.1	2.20	2.95	3.83	293.2	2.48	2.09	1.73
510.1	540.1	1.34	1.25	1.16	510.1	2.26	3.08	4.05	305.5	2.43	2.05	1.70
530.1	560.1	1.40	1.30	1.19	530.1	2.28	3.10	4.09	317.8	2.42	2.04	1.70
570.1	600.1	1.52	1.38	1.29	570.1	2.29	3.08	4.04	330.1	2.40	2.03	1.71
590.1	620.1	1.56	1.43	1.37	590.1	2.30	3.09	4.03	342.4	2.41	2.02	1.72
630.1	660.1	1.67	1.59	1.56	630.1	2.30	3.05	3.96	354.7	2.39	2.01	1.71
650.1	680.1	1.73	1.67	1.65	650.1	2.28	3.01	3.94	367.0	2.35	1.98	1.68
690.1	720.1	1.89	1.86	1.85	690.1	2.28	3.05	4.00	379.3	2.33	1.96	1.67
710.1	740.1	1.98	1.95	1.94	710.1	2.31	3.08	4.02	391.6	2.34	1.97	1.68
750.1	780.1	2.12	2.09	2.08	750.1	2.43	3.18	4.09	403.9	2.32	1.96	1.68
770.1	800.1	2.17	2.14	2.12	770.1	2.53	3.25	4.15	416.3	2.27	1.93	1.67
810.1	840.1	2.25	2.19	2.17	810.1	2.76	3.40	4.23	428.6	2.23	1.88	1.64
830.1	860.1	2.25	2.20	2.16	830.1	2.87	3.47	4.26	440.9	2.19	1.86	1.62
870.1	900.1	2.26	2.18	2.12	870.1	3.14	3.62	4.35	453.2	2.18	1.85	1.62
890.1	920.1	2.25	2.16	2.10	890.1	3.26	3.70	4.37	465.5	2.20	1.86	1.62
930.1	960.1	2.27	2.16	2.10	930.1	3.50	3.81	4.38	477.8	2.22	1.87	1.63
950.1	980.1	2.28	2.15	2.09	950.1	3.60	3.86	4.39	490.1	2.21	1.86	1.62

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## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	24	40	25	47	27	52	37	61	59	55
1	-	20	+0	29	12	34	23	41	38	52	59	57
2	93	61	41	79	42	59	42	58	45	72	55	75
3	>100	42	39	47	42	47	36	44	45	51	55	61
4	>100	87	59	67	56	71	56	71	52	62	58	70
5	>100	65	63	61	48	68	47	63	46	64	61	71
6	>100	85	77	87	75	81	73	80	67	73	75	76
7	>100	>95	78	77	73	67	66	69	65	64	56	63
8	>100	>95	94	>95	90	>95	81	85	76	82	72	81
9	>100	92	93	90	83	81	71	82	73	>95	70	80
10	>100	>95	>95	>95	>95	>95	88	90	84	94	86	88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 0.00 dBm.  
 LO IN: 280.01 MHz; +10.00 dBm  
 IF OUT: 29.91 MHz; -5.15 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	28	14	34	15	41	24	49	40	40
1	-	19	+0	27	11	32	21	35	37	47	45	47
2	>100	69	47	72	48	75	45	60	50	71	57	>85
3	>100	71	57	73	56	75	55	77	66	77	73	>85
4	>100	>85	>85	>85	>85	>85	82	>85	81	>85	>85	>85
5	>100	>85	>85	>85	>85	>85	>85	>85	82	>85	>85	>85
6	>100	>85	>85	>85	>85	>85	>85	>85	>85	>85	>85	>85
7	>100	>85	>85	>85	>85	>85	>85	83	>85	>85	>85	>85
8	>100	>85	>85	>85	>85	>85	>85	>85	>85	>85	>85	>85
9	>100	>85	>85	>85	>85	>85	>85	>85	>85	76	>85	>85
10	>100	>85	>85	>85	>85	>85	>85	>85	>85	>85	67	>85
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -10.00 dBm.  
 LO IN: 280.01 MHz; +10.00 dBm  
 IF OUT: 29.91 MHz; -15.1 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.

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