

Frequency Mixer

ADE-1HW+

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
5.0	35.0	7.24	6.34	5.94	10.1	40.1	18.30	23.34	25.67	10.1	40.1	0.12	0.17	0.11
10.0	40.0	6.97	6.07	5.77	50.4	80.4	20.45	22.89	30.58	50.4	80.4	0.25	0.21	0.12
50.4	80.4	7.39	6.38	5.91	90.7	120.7	20.07	28.27	32.23	90.7	120.7	0.31	0.21	0.13
90.7	120.7	7.62	6.29	5.85	131.0	161.0	26.56	29.04	32.04	131.0	161.0	0.64	0.30	0.12
131.0	161.0	7.14	6.12	5.86	171.3	201.3	25.31	29.68	31.05	171.3	201.3	0.54	0.24	0.12
171.3	201.3	6.88	6.12	5.88	211.5	241.5	23.59	29.13	27.66	211.5	241.5	0.81	0.32	0.15
211.5	241.5	6.98	6.17	5.92	251.8	281.8	25.92	28.56	28.25	251.8	281.8	0.79	0.29	0.16
251.8	281.8	6.77	6.16	5.98	292.1	322.1	25.40	32.30	26.61	292.1	322.1	0.85	0.38	0.18
292.1	322.1	6.85	6.18	6.00	332.4	362.4	25.59	23.79	25.59	332.4	362.4	0.88	0.30	0.20
332.4	362.4	6.84	6.32	6.05	372.7	402.7	27.19	24.80	23.10	372.7	402.7	0.81	0.33	0.19
372.7	402.7	6.91	6.32	6.13	413.0	443.0	23.69	27.91	25.46	413.0	443.0	0.90	0.44	0.23
413.0	443.0	6.98	6.36	6.15	453.3	483.3	24.32	25.56	27.97	453.3	483.3	0.89	0.31	0.29
453.3	483.3	6.99	6.51	6.17	493.6	523.6	27.28	23.98	23.69	493.6	523.6	1.13	0.41	0.29
493.6	523.6	6.91	6.56	6.30	533.9	563.9	31.86	24.02	22.48	533.9	563.9	1.36	0.50	0.31
533.9	563.9	6.95	6.65	6.43	574.2	604.2	25.53	23.74	21.49	574.2	604.2	1.51	0.65	0.42
574.2	604.2	7.00	6.65	6.43	614.4	644.4	22.84	23.91	21.71	614.4	644.4	1.69	0.99	0.60
614.4	644.4	7.22	6.71	6.39	654.7	684.7	25.21	24.56	26.15	654.7	684.7	1.59	1.24	0.71
654.7	684.7	7.59	6.73	6.35	695.0	725.0	17.20	22.98	26.78	695.0	725.0	1.55	1.33	0.97
695.0	725.0	8.01	7.03	6.38	735.3	765.3	15.15	17.61	24.16	735.3	765.3	1.47	1.03	1.09
735.3	765.3	8.31	7.57	6.64	775.6	805.6	15.15	15.49	21.28	775.6	805.6	1.59	0.99	1.03
775.6	805.6	8.38	7.74	6.96	815.9	845.9	15.42	14.97	17.29	815.9	845.9	1.58	0.93	0.89
815.9	845.9	8.62	8.02	7.33	856.2	886.2	16.07	15.26	16.07	856.2	886.2	1.49	0.88	0.79
856.2	886.2	8.81	8.17	7.57	896.5	926.5	16.52	15.75	15.81	896.5	926.5	1.62	0.88	0.75
896.5	926.5	8.99	8.34	7.79	916.6	946.6	17.05	16.20	16.19	916.6	946.6	1.64	0.84	0.72
916.6	946.6	9.10	8.50	7.94	956.9	986.9	17.84	17.04	16.82	956.9	986.9	1.65	0.83	0.68
956.9	986.9	9.31	8.63	8.05	977.1	1007.1	18.39	17.74	17.37	977.1	1007.1	1.79	0.83	0.70
977.1	1007.1	9.46	8.72	8.06	1017.3	1047.3	19.41	18.29	18.15	1017.3	1047.3	1.71	0.90	0.86
1017.3	1047.3	9.80	8.83	8.01	1037.5	1067.5	19.78	18.90	19.04	1037.5	1067.5	1.59	0.95	0.95
1037.5	1067.5	9.97	8.82	7.95	1077.8	1107.8	19.43	19.78	19.81	1077.8	1107.8	1.33	1.12	1.08
1077.8	1107.8	10.57	8.90	7.91	1097.9	1127.9	19.24	19.79	20.22	1097.9	1127.9	1.25	1.21	1.18
1097.9	1127.9	10.77	8.88	7.83	1138.2	1168.2	18.59	18.84	20.72	1138.2	1168.2	0.94	1.39	1.16
1138.2	1168.2	11.71	8.96	7.96	1158.4	1188.4	18.09	18.18	20.64	1158.4	1188.4	0.90	1.55	1.22
1158.4	1188.4	12.30	9.06	8.22	1198.7	1228.7	18.14	17.31	20.25	1198.7	1228.7	0.77	1.74	1.20
1198.7	1228.7	12.41	9.11	8.40	1218.8	1248.8	18.21	17.18	20.15	1218.8	1248.8	0.77	1.81	1.19
1218.8	1248.8	13.03	9.54	8.77	1259.1	1289.1	18.31	17.13	19.70	1259.1	1289.1	0.71	1.89	1.17
1259.1	1289.1	13.37	9.76	9.00	1279.2	1309.2	18.51	17.31	19.59	1279.2	1309.2	0.78	1.83	1.11
1279.2	1309.2	13.43	10.08	9.47	1319.5	1349.5	23.63	18.33	19.50	1319.5	1349.5	0.93	1.75	1.06
1319.5	1349.5	13.58	10.37	9.77	1339.7	1369.7	28.46	18.56	19.94	1339.7	1369.7	1.16	1.72	1.01
1339.7	1369.7	14.01	10.99	10.31	1380.0	1410.0	23.20	19.50	21.27	1380.0	1410.0	1.39	1.71	1.03
1380.0	1410.0	13.99	11.15	10.52	1400.1	1430.1	20.48	20.28	21.83	1400.1	1430.1	1.45	1.62	1.04
1400.1	1430.1													



Frequency Mixer

ADE-1HW+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=375.1MHz (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)=750.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
365.0	10.1	6.53	10.0	20.1	6.44	740.0	10.1	7.04
355.9	19.2	6.60	28.7	38.8	6.29	721.3	28.8	7.08
346.8	28.3	6.68	47.4	57.5	6.37	702.6	47.5	6.95
337.7	37.4	6.51	66.2	76.3	6.25	683.8	66.3	6.61
328.6	46.5	6.57	84.9	95.0	6.15	665.1	85.0	6.51
319.5	55.6	6.42	103.6	113.7	6.03	646.4	103.7	6.43
310.4	64.7	6.35	122.3	132.4	6.07	627.7	122.4	6.41
301.3	73.8	6.37	141.0	151.1	6.12	609.0	141.1	6.32
292.2	82.9	6.19	159.7	169.8	6.11	590.3	159.8	6.22
283.1	92.0	6.26	178.5	188.6	6.07	571.5	178.6	6.23
274.0	101.1	6.15	197.2	207.3	6.08	552.8	197.3	6.21
264.9	110.2	6.11	215.9	226.0	6.16	534.1	216.0	6.22
255.8	119.3	6.10	234.6	244.7	6.19	515.4	234.7	6.20
246.7	128.4	5.98	253.3	263.4	6.27	496.7	253.4	6.24
237.6	137.5	6.05	272.1	282.2	6.23	477.9	272.2	6.19
228.5	146.6	5.96	290.8	300.9	6.27	459.2	290.9	6.25
219.4	155.7	5.93	309.5	319.6	6.29	440.5	309.6	6.31
210.3	164.8	5.94	328.2	338.3	6.40	421.8	328.3	6.31
201.2	173.9	5.92	346.9	357.0	6.39	403.1	347.0	6.29
192.1	183.0	5.88	365.6	375.7	6.48	384.4	365.7	6.35
182.9	192.2	5.87	384.4	394.5	6.46	365.6	384.5	6.42
173.8	201.3	5.94	403.1	413.2	6.44	346.9	403.2	6.41
164.7	210.4	5.95	421.8	431.9	6.52	328.2	421.9	6.48
155.6	219.5	5.93	440.5	450.6	6.63	309.5	440.6	6.49
146.5	228.6	5.97	459.2	469.3	6.72	290.8	459.3	6.51
137.4	237.7	5.99	477.9	488.0	6.72	272.1	478.0	6.51
128.3	246.8	5.97	496.7	506.8	6.83	253.3	496.8	6.61
119.2	255.9	5.95	515.4	525.5	6.78	234.6	515.5	6.59
110.1	265.0	5.97	534.1	544.2	6.80	215.9	534.2	6.69
101.0	274.1	6.02	552.8	562.9	6.76	197.2	552.9	6.69
91.9	283.2	5.99	571.5	581.6	6.71	178.5	571.6	6.75
82.8	292.3	6.01	590.3	600.4	6.67	159.7	590.4	6.81
73.7	301.4	6.06	609.0	619.1	6.65	141.0	609.1	6.82
64.6	310.5	6.09	627.7	637.8	6.64	122.3	627.8	6.84
55.5	319.6	6.08	646.4	656.5	6.57	103.6	646.5	6.78
46.4	328.7	6.10	665.1	675.2	6.54	84.9	665.2	6.82
37.3	337.8	6.17	683.8	693.9	6.49	66.2	683.9	6.75
28.2	346.9	6.21	702.6	712.7	6.54	47.4	702.7	6.87
19.1	356.0	6.19	721.3	731.4	6.71	28.7	721.4	7.02
10.0	365.1	6.32	740.0	750.1	6.86	10.0	740.1	7.29



Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
5.0	61.40	64.80	68.50	64.40	52.10	47.90
10.0	60.70	64.50	68.40	65.30	50.90	46.90
50.4	57.76	61.86	67.84	59.66	57.37	50.00
90.7	53.73	57.66	63.02	57.72	52.69	45.94
131.0	49.62	53.69	60.95	49.37	52.88	43.45
171.3	47.56	51.71	58.50	48.42	50.34	42.37
211.5	45.66	50.41	57.92	46.74	49.87	41.61
251.8	43.98	48.91	56.09	44.75	53.31	42.30
292.1	43.09	47.46	53.95	44.97	49.46	41.46
332.4	41.80	46.38	52.59	41.17	47.18	41.29
372.7	41.32	46.11	53.11	40.71	44.97	41.52
413.0	40.45	46.11	53.62	40.38	41.36	39.10
453.3	39.34	44.06	50.56	38.15	37.65	36.51
493.6	38.31	42.17	47.97	36.31	35.82	34.39
533.9	37.65	41.34	46.16	33.87	34.71	34.09
574.2	37.45	41.46	47.02	31.63	33.28	33.70
614.4	36.81	40.88	46.45	29.90	31.99	32.62
654.7	36.54	41.31	48.07	28.21	30.74	31.89
695.0	35.83	41.22	47.74	27.30	29.80	30.79
735.3	34.63	39.47	46.74	26.93	28.95	29.21
775.6	34.30	38.55	46.16	27.08	29.05	29.26
815.9	33.95	38.31	45.85	26.63	28.49	29.43
856.2	33.22	37.82	45.57	25.74	27.51	28.96
896.5	32.40	36.70	43.45	24.98	26.66	28.25
916.6	31.83	35.63	40.66	24.37	25.97	27.52
956.9	31.12	34.82	39.86	23.47	25.04	26.64
977.1	30.69	34.42	39.96	23.02	24.50	26.22
1017.3	29.97	33.71	39.87	22.13	23.49	25.32
1037.5	29.74	33.77	41.31	21.68	22.96	24.99
1077.8	28.90	33.04	41.80	21.09	22.39	24.77
1097.9	28.60	32.54	41.01	20.59	21.83	24.28
1158.4	27.40	31.53	42.23	19.31	20.79	23.22
1198.7	26.49	30.81	40.01	18.54	20.00	22.04
1218.8	26.14	30.54	37.97	18.10	19.60	21.55
1259.1	25.31	29.76	34.51	17.39	18.94	20.50
1279.2	24.99	29.17	33.68	17.02	18.36	19.97
1319.5	24.20	27.88	30.98	16.41	17.47	18.98
1339.7	23.94	27.51	30.44	15.93	17.12	18.66
1380.0	23.31	25.96	28.62	15.62	16.32	17.91
1400.1	23.15	25.39	27.97	15.49	15.96	17.63

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	45.19	53.90	56.96
50.4	80.4	36.51	36.99	37.68
90.7	120.7	31.43	32.48	32.74
131.0	161.0	28.97	29.69	29.96
171.3	201.3	27.34	28.02	28.23
211.5	241.5	25.93	26.61	26.90
251.8	281.8	25.31	25.91	26.28
292.1	322.1	24.57	25.47	25.86
332.4	362.4	24.18	24.91	25.37
372.7	402.7	24.12	24.73	25.10
413.0	443.0	23.98	24.63	24.85
453.3	483.3	23.95	24.61	24.97
493.6	523.6	23.71	24.18	24.62
533.9	563.9	22.81	23.02	23.26
574.2	604.2	21.68	21.78	22.01
614.4	644.4	20.42	20.33	20.34
654.7	684.7	19.70	19.32	19.22
695.0	725.0	19.76	19.43	19.15
735.3	765.3	19.72	19.66	19.35
775.6	805.6	19.42	19.34	19.34
815.9	845.9	19.24	19.12	19.10
856.2	886.2	18.91	18.88	18.88
896.5	926.5	18.38	18.42	18.68
916.6	946.6	18.15	18.23	18.38
956.9	986.9	17.50	17.68	17.97
977.1	1007.1	17.15	17.50	17.76
1017.3	1047.3	16.40	16.94	17.00
1037.5	1067.5	15.95	16.60	16.57
1077.8	1107.8	15.06	15.80	15.75
1097.9	1127.9	14.61	15.34	15.27
1138.2	1168.2	13.58	14.30	14.29
1158.4	1188.4	13.04	13.80	13.82
1198.7	1228.7	12.08	12.79	12.74
1218.8	1248.8	11.65	12.27	12.12
1259.1	1289.1	10.67	11.29	11.09
1279.2	1309.2	10.27	10.83	10.58
1319.5	1349.5	9.45	9.86	9.64
1339.7	1369.7	8.95	9.37	9.20
1380.0	1410.0	8.32	8.51	8.49
1400.1	1430.1	8.06	8.15	8.12

Frequency Mixer

ADE-1HW+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+14	+17	+20
5.0	35.1	1.44	1.35	1.34
10.0	40.1	1.35	1.20	1.18
50.4	80.4	1.33	1.11	1.04
90.7	120.7	1.34	1.08	1.05
131.0	161.0	1.26	1.04	1.06
171.3	201.3	1.21	1.02	1.07
211.5	241.5	1.23	1.03	1.06
251.8	281.8	1.17	1.02	1.07
292.1	322.1	1.20	1.02	1.07
332.4	362.4	1.18	1.03	1.07
372.7	402.7	1.17	1.03	1.07
413.0	443.0	1.17	1.04	1.09
453.3	483.3	1.14	1.06	1.13
493.6	523.6	1.11	1.08	1.13
533.9	563.9	1.09	1.10	1.15
574.2	604.2	1.09	1.11	1.17
614.4	644.4	1.11	1.12	1.19
654.7	684.7	1.17	1.13	1.21
695.0	725.0	1.28	1.15	1.21
735.3	765.3	1.36	1.23	1.23
775.6	805.6	1.42	1.30	1.27
815.9	845.9	1.51	1.39	1.35
856.2	886.2	1.62	1.51	1.45
896.5	926.5	1.73	1.62	1.56
916.6	946.6	1.80	1.68	1.61
956.9	986.9	1.93	1.80	1.72
977.1	1007.1	2.02	1.88	1.79
1017.3	1047.3	2.18	2.00	1.92
1037.5	1067.5	2.28	2.08	2.01
1077.8	1107.8	2.48	2.24	2.17
1097.9	1127.9	2.57	2.32	2.25
1138.2	1168.2	2.80	2.49	2.41
1158.4	1188.4	2.92	2.56	2.47
1198.7	1228.7	3.11	2.70	2.58
1218.8	1248.8	3.18	2.75	2.64
1259.1	1289.1	3.34	2.86	2.71
1279.2	1309.2	3.40	2.90	2.75
1319.5	1349.5	3.39	2.93	2.79
1339.7	1369.7	3.43	2.98	2.84
1380.0	1410.0	3.43	3.00	2.86
1400.1	1430.1	3.43	3.00	2.87

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+14	+17	+20
5.0	2.40	1.38	1.30
10.0	2.55	1.38	1.31
50.4	3.14	1.60	1.26
90.7	2.58	1.57	1.35
131.0	3.16	1.70	1.42
171.3	2.82	1.67	1.51
211.5	2.70	1.62	1.61
251.8	2.59	1.64	1.69
292.1	2.25	1.62	1.80
332.4	2.13	1.62	1.90
372.7	1.94	1.67	1.99
413.0	1.84	1.73	2.13
453.3	1.75	1.75	2.19
493.6	1.71	1.85	2.31
533.9	1.64	1.91	2.40
574.2	1.57	1.97	2.52
614.4	1.54	2.04	2.62
654.7	1.55	2.07	2.66
695.0	1.63	2.16	2.76
735.3	1.72	2.25	2.83
775.6	1.82	2.39	2.98
815.9	1.89	2.49	3.11
856.2	1.97	2.57	3.20
896.5	2.07	2.68	3.33
916.6	2.12	2.72	3.37
956.9	2.22	2.79	3.44
977.1	2.28	2.83	3.48
1017.3	2.42	2.91	3.56
1037.5	2.48	2.95	3.58
1077.8	2.63	3.00	3.61
1097.9	2.72	3.04	3.62
1138.2	2.92	3.14	3.67
1158.4	3.01	3.16	3.65
1198.7	3.24	3.25	3.67
1218.8	3.37	3.33	3.73
1259.1	3.62	3.50	3.85
1279.2	3.76	3.59	3.89
1319.5	4.07	3.83	4.05
1339.7	4.19	3.95	4.13
1380.0	4.45	4.15	4.21
1400.1	4.57	4.24	4.25

IF (OUT) (MHz)	IF VSWR @LO=750.5MHz (:1)		
	@LO (dBm)		
	+14	+17	+20
0.1	2.92	2.20	1.69
0.5	3.01	2.27	1.74
1.0	3.11	2.35	1.78
5.0	3.11	2.35	1.77
10.0	3.11	2.35	1.78
28.5	3.56	2.53	1.82
47.0	3.38	2.42	1.77
65.5	3.12	2.25	1.67
84.0	3.23	2.32	1.70
102.5	3.33	2.38	1.76
121.0	3.28	2.36	1.75
139.5	3.22	2.32	1.72
158.0	3.18	2.31	1.72
176.5	3.30	2.40	1.80
195.0	3.31	2.40	1.79
213.5	3.18	2.32	1.75
232.0	3.21	2.34	1.78
250.5	3.07	2.26	1.74
269.0	3.01	2.23	1.72
287.5	2.98	2.21	1.71
306.0	3.04	2.27	1.77
324.5	2.99	2.24	1.76
343.0	2.84	2.14	1.69
361.5	2.83	2.13	1.69
380.0	2.86	2.17	1.74
398.5	2.83	2.14	1.73
417.0	2.77	2.09	1.69
435.5	2.77	2.09	1.69
454.0	2.74	2.09	1.71
491.0	2.64	2.01	1.65
509.5	2.71	2.06	1.69
528.0	2.62	2.00	1.67
546.5	2.53	1.93	1.62
583.5	2.57	1.96	1.65
602.0	2.54	1.94	1.64
620.5	2.50	1.89	1.60
639.0	2.51	1.89	1.58
657.5	2.50	1.89	1.60
694.5	2.47	1.85	1.55
731.5	2.55	1.90	1.59
750.0	2.33	1.80	1.66

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	32	7	25	17	37	39	42	38	46
1	-	18	+0	32	14	31	30	35	28	58	33	52
2	>100	85	44	57	43	56	40	62	50	59	62	62
3	>100	65	56	66	55	73	49	68	49	65	52	71
4	>100	76	77	78	85	73	75	76	74	74	71	79
5	>100	>92	78	85	79	83	74	80	74	80	77	83
6	>100	>92	>92	89	90	92	86	>92	84	>92	84	>92
7	>100	>92	>92	>92	>92	>92	>92	92	90	>92	>92	>92
8	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
9	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
10	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 370.1 MHz; -1.00 dBm.
 LO IN: 400.01 MHz; +17.00 dBm
 IF OUT: 29.91 MHz; -7.6 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	27	42	20	37	32	57	55	63	52	62
1	-	19	+0	33	14	34	25	37	36	58	43	55
2	89	57	41	53	38	57	35	54	43	59	64	64
3	>100	51	42	54	47	58	38	50	43	55	42	74
4	>100	65	52	82	52	67	52	65	48	84	61	72
5	>100	73	59	77	53	73	50	63	46	67	49	63
6	>100	89	63	77	65	77	66	78	65	84	63	79
7	>100	83	84	78	67	91	67	78	63	76	60	80
8	>100	99	85	89	79	79	80	78	76	75	69	78
9	>100	100	91	100	80	91	70	80	69	80	70	78
10	>100	102	>102	101	102	93	89	85	78	84	76	83
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 370.1 MHz; 9.00 dBm.
 LO IN: 400.01 MHz; +17.00 dBm
 IF OUT: 29.91 MHz; 2.38 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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