

Frequency Mixer

ADE-ED7022/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP-3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+10	+13	+16			+10	+13	+16			+10	+13	+16
10.1	40.1	5.16	4.89	4.76	10.1	40.1	24.69	29.56	29.78	10.1	40.1	1.77	1.56	1.38
50.4	80.4	5.63	5.32	5.20	50.4	80.4	24.84	27.76	31.13	50.4	80.4	1.70	1.49	1.31
90.7	120.7	5.63	5.31	5.20	90.7	120.7	25.46	29.26	26.25	90.7	120.7	1.70	1.51	1.32
131.0	161.0	5.57	5.33	5.23	131.0	161.0	25.66	25.70	23.80	131.0	161.0	1.74	1.51	1.31
171.3	201.3	5.59	5.37	5.26	171.3	201.3	25.00	22.68	25.70	171.3	201.3	1.64	1.41	1.24
211.5	241.5	5.58	5.36	5.25	211.5	241.5	21.01	21.79	24.71	211.5	241.5	1.67	1.45	1.28
251.8	281.8	5.62	5.42	5.32	251.8	281.8	24.59	25.18	25.26	251.8	281.8	1.61	1.35	1.21
292.1	322.1	5.66	5.47	5.35	292.1	322.1	18.13	17.41	18.43	292.1	322.1	1.57	1.35	1.22
332.4	362.4	5.68	5.50	5.40	332.4	362.4	20.46	19.33	20.46	332.4	362.4	1.56	1.33	1.19
372.7	402.7	5.89	5.51	5.33	372.7	402.7	18.70	25.03	31.11	372.7	402.7	1.46	1.38	1.18
413.0	443.0	5.95	5.74	5.53	413.0	443.0	15.32	15.18	18.00	413.0	443.0	1.47	1.31	1.21
453.3	483.3	5.96	5.78	5.65	453.3	483.3	17.44	16.85	17.09	453.3	483.3	1.57	1.35	1.22
493.6	523.6	5.94	5.71	5.54	493.6	523.6	22.94	24.72	23.84	493.6	523.6	1.82	1.54	1.41
533.9	563.9	5.86	5.59	5.48	533.9	563.9	24.43	20.44	24.25	533.9	563.9	2.08	1.59	1.38
574.2	604.2	6.02	5.68	5.55	574.2	604.2	17.79	26.76	29.76	574.2	604.2	2.36	1.86	1.60
614.4	644.4	6.50	5.87	5.64	614.4	644.4	10.44	19.42	29.07	614.4	644.4	2.40	2.27	1.91
654.7	684.7	6.94	6.42	5.85	654.7	684.7	7.73	10.25	17.30	654.7	684.7	2.40	2.28	2.12
695.0	725.0	7.39	6.90	6.32	695.0	725.0	7.70	8.08	10.47	695.0	725.0	2.38	2.25	2.20
735.3	765.3	7.95	7.43	6.93	735.3	765.3	8.36	8.41	9.00	735.3	765.3	2.12	2.06	2.01
775.6	805.6	8.44	7.90	7.36	775.6	805.6	9.79	10.45	11.52	775.6	805.6	1.78	1.79	1.84
815.9	845.9	8.60	7.96	7.28	815.9	845.9	12.18	13.74	16.47	815.9	845.9	1.70	1.78	1.89
856.2	886.2	8.48	7.65	7.01	856.2	886.2	13.08	17.28	19.76	856.2	886.2	1.82	1.96	1.86
896.5	926.5	8.03	7.11	6.53	896.5	926.5	14.73	20.26	22.40	896.5	926.5	2.20	2.18	2.03
916.6	946.6	7.84	6.94	6.50	916.6	946.6	16.93	25.15	22.71	916.6	946.6	2.34	2.21	2.01
956.9	986.9	7.32	6.80	6.55	956.9	986.9	20.28	20.96	22.95	956.9	986.9	2.60	2.24	1.98
977.1	1007.1	7.25	6.84	6.65	977.1	1007.1	19.62	21.19	22.63	977.1	1007.1	2.49	2.13	1.87
1017.3	1047.3	7.36	7.02	6.85	1017.3	1047.3	19.82	21.37	22.78	1017.3	1047.3	2.22	1.91	1.71
1037.5	1067.5	7.45	7.16	6.98	1037.5	1067.5	19.53	21.13	22.48	1037.5	1067.5	2.06	1.77	1.62
1077.8	1107.8	7.73	7.42	7.25	1077.8	1107.8	18.86	20.58	21.75	1077.8	1107.8	1.81	1.61	1.51
1097.9	1127.9	7.92	7.58	7.41	1097.9	1127.9	18.91	20.27	21.40	1097.9	1127.9	1.80	1.63	1.54
1138.2	1168.2	8.34	8.04	7.86	1138.2	1168.2	19.28	19.59	20.79	1138.2	1168.2	1.70	1.44	1.39
1158.4	1188.4	8.55	8.28	8.14	1158.4	1188.4	18.59	18.89	19.45	1158.4	1188.4	1.67	1.39	1.33
1198.7	1228.7	8.83	8.64	8.55	1198.7	1228.7	17.86	19.12	19.77	1198.7	1228.7	1.67	1.25	1.16
1218.8	1248.8	8.96	8.81	8.77	1218.8	1248.8	17.92	20.14	21.10	1218.8	1248.8	1.65	1.19	1.06
1259.1	1289.1	9.24	9.09	9.08	1259.1	1289.1	17.07	20.35	21.75	1259.1	1289.1	1.73	1.21	0.98
1279.2	1309.2	9.42	9.22	9.28	1279.2	1309.2	16.77	19.46	21.22	1279.2	1309.2	1.76	1.17	0.90
1319.5	1349.5	9.87	9.71	9.75	1319.5	1349.5	16.07	18.52	20.72	1319.5	1349.5	1.82	1.10	0.79
1339.7	1369.7	10.13	9.92	9.98	1339.7	1369.7	16.17	19.06	21.16	1339.7	1369.7	1.73	1.00	0.69
1380.0	1410.0	10.70	10.48	10.52	1380.0	1410.0	15.64	19.80	21.70	1380.0	1410.0	1.84	0.97	0.67
1400.1	1430.1	10.96	10.76	10.75	1400.1	1430.1	15.90	20.62	20.51	1400.1	1430.1	1.77	0.92	0.63

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (dB)
		@LO (dBm)
		+13
240.0	10.1	5.46
234.1	16.0	5.45
228.2	21.9	5.43
222.3	27.8	5.43
216.4	33.7	5.41
210.5	39.6	5.40
204.6	45.5	5.39
198.7	51.4	5.36
192.8	57.3	5.35
186.9	63.2	5.32
181.0	69.1	5.33
175.1	75.0	5.34
169.2	80.9	5.31
163.3	86.8	5.29
157.4	92.7	5.29
151.5	98.6	5.27
145.6	104.5	5.29
139.7	110.4	5.29
133.8	116.3	5.27
127.9	122.2	5.24
122.1	128.0	5.23
116.2	133.9	5.26
110.3	139.8	5.28
104.4	145.7	5.28
98.5	151.6	5.28
92.6	157.5	5.27
86.7	163.4	5.28
80.8	169.3	5.29
74.9	175.2	5.30
69.0	181.1	5.29
63.1	187.0	5.28
57.2	192.9	5.28
51.3	198.8	5.30
45.4	204.7	5.33
39.5	210.6	5.36
33.6	216.5	5.35
27.7	222.4	5.36
21.8	228.3	5.40
15.9	234.2	5.44
10.0	240.1	5.56

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)
		@LO (dBm)
		+13
10.0	20.1	5.19
22.3	32.4	5.04
34.6	44.7	5.01
46.9	57.0	5.01
59.2	69.3	4.98
71.5	81.6	5.00
83.8	93.9	5.01
96.2	106.3	5.01
108.5	118.6	5.02
120.8	130.9	5.01
133.1	143.2	5.01
145.4	155.5	5.06
157.7	167.8	5.06
170.0	180.1	5.05
182.3	192.4	5.07
194.6	204.7	5.08
206.9	217.0	5.08
219.2	229.3	5.08
231.5	241.6	5.09
243.8	253.9	5.13
256.2	266.3	5.14
268.5	278.6	5.12
280.8	290.9	5.14
293.1	303.2	5.17
305.4	315.5	5.20
317.7	327.8	5.25
330.0	340.1	5.24
342.3	352.4	5.20
354.6	364.7	5.19
366.9	377.0	5.17
379.2	389.3	5.14
391.5	401.6	5.13
403.8	413.9	5.15
416.2	426.3	5.28
428.5	438.6	5.37
440.8	450.9	5.40
453.1	463.2	5.42
465.4	475.5	5.42
477.7	487.8	5.43
490.0	500.1	5.46

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB)
		@LO (dBm)
		+13
490.0	10.1	5.68
477.7	22.4	5.68
465.4	34.7	5.63
453.1	47.0	5.61
440.8	59.3	5.63
428.5	71.6	5.57
416.2	83.9	5.52
403.8	96.3	5.47
391.5	108.6	5.44
379.2	120.9	5.45
366.9	133.2	5.46
354.6	145.5	5.44
342.3	157.8	5.45
330.0	170.1	5.46
317.7	182.4	5.46
305.4	194.7	5.49
293.1	207.0	5.47
280.8	219.3	5.47
268.5	231.6	5.49
256.2	243.9	5.51
243.8	256.3	5.53
231.5	268.6	5.52
219.2	280.9	5.49
206.9	293.2	5.52
194.6	305.5	5.54
182.3	317.8	5.56
170.0	330.1	5.60
157.7	342.4	5.62
145.4	354.7	5.64
133.1	367.0	5.65
120.8	379.3	5.60
108.5	391.6	5.56
96.2	403.9	5.56
83.8	416.3	5.58
71.5	428.6	5.68
59.2	440.9	5.73
46.9	453.2	5.72
34.6	465.5	5.77
22.3	477.8	5.80
10.0	490.1	5.95

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
40.1	68.92	69.16	69.56	79.02	69.66	68.85
80.4	56.23	56.29	56.32	57.82	55.74	54.39
120.7	51.52	51.73	51.99	52.52	50.61	49.51
161.0	48.90	49.34	49.22	49.20	47.71	47.12
201.3	47.48	47.71	47.43	47.06	46.24	45.51
241.5	46.08	45.98	45.58	46.15	45.30	44.23
281.8	44.99	44.89	44.50	45.73	44.23	43.07
322.1	43.62	43.11	42.72	45.84	44.15	42.55
362.4	42.89	42.49	41.84	44.83	42.31	40.41
402.7	42.17	41.84	41.35	44.75	41.96	39.66
443.0	39.72	39.50	39.12	40.02	39.81	38.65
483.3	38.12	37.82	37.45	38.78	36.67	35.45
523.6	36.79	36.63	36.22	38.62	35.90	34.27
563.9	34.87	34.43	33.85	38.72	35.10	32.65
604.2	34.63	33.92	33.21	39.44	35.16	32.22
644.4	34.88	33.68	32.49	36.14	33.81	31.48
684.7	34.09	33.06	31.88	33.90	32.10	29.94
725.0	33.37	32.37	31.16	31.24	30.44	28.83
765.3	32.58	31.91	30.71	29.28	28.24	27.07
805.6	32.06	31.41	30.34	28.25	26.99	25.87
845.9	31.73	31.15	30.21	27.43	26.16	24.95
886.2	31.60	31.06	30.33	27.07	25.98	24.53
926.5	31.23	30.61	29.83	27.38	26.29	23.96
946.6	31.22	30.44	29.67	27.41	25.82	23.06
986.9	31.00	30.09	29.57	26.43	23.93	21.87
1007.1	30.96	30.10	29.53	25.38	23.12	21.25
1047.3	31.42	30.58	30.12	22.63	21.13	19.68
1067.5	31.93	31.05	30.64	21.57	20.47	19.17
1107.8	32.88	31.54	30.99	19.64	19.12	18.05
1127.9	33.10	31.28	30.48	18.72	18.40	17.39
1168.2	33.63	30.69	29.37	17.29	17.46	16.64
1188.4	33.50	30.12	28.61	16.68	17.05	16.32
1228.7	32.63	28.49	26.54	15.46	16.19	15.71
1248.8	32.25	27.80	25.70	14.89	15.89	15.59
1289.1	30.33	26.28	24.17	13.97	15.20	15.10
1309.2	29.23	25.38	23.27	13.63	14.99	14.95
1349.5	27.16	24.07	22.03	12.81	14.42	14.54
1369.7	26.29	23.53	21.58	12.60	14.30	14.45
1410.0	24.26	22.40	20.60	11.94	13.86	14.25
1430.1	23.29	21.88	20.22	11.47	13.51	14.16

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
10.1	40.1	42.25	44.24	42.96
50.4	80.4	31.93	31.92	31.74
90.7	120.7	27.44	27.52	27.55
131.0	161.0	24.82	24.97	25.05
171.3	201.3	23.28	23.40	23.50
211.5	241.5	22.18	22.31	22.42
251.8	281.8	21.81	21.95	21.98
292.1	322.1	21.31	21.54	21.90
332.4	362.4	21.36	21.72	21.98
372.7	402.7	21.84	22.15	22.47
413.0	443.0	22.85	23.04	23.21
453.3	483.3	23.59	24.01	24.46
493.6	523.6	23.52	24.03	24.68
533.9	563.9	22.67	23.58	24.22
574.2	604.2	20.59	20.58	20.47
614.4	644.4	19.02	18.42	18.06
654.7	684.7	17.57	17.34	16.86
695.0	725.0	16.63	16.39	16.28
735.3	765.3	16.40	16.08	15.89
775.6	805.6	16.16	15.88	15.71
815.9	845.9	15.83	15.61	15.73
856.2	886.2	15.51	15.36	15.21
896.5	926.5	15.00	14.54	14.29
916.6	946.6	14.70	14.31	14.23
956.9	986.9	14.39	14.30	14.31
977.1	1007.1	14.37	14.30	14.28
1017.3	1047.3	14.32	14.24	14.15
1037.5	1067.5	14.24	14.15	14.03
1077.8	1107.8	13.95	13.83	13.62
1097.9	1127.9	13.76	13.69	13.50
1138.2	1168.2	13.08	13.09	13.02
1158.4	1188.4	12.61	12.59	12.52
1198.7	1228.7	11.47	11.27	11.08
1218.8	1248.8	10.87	10.56	10.28
1259.1	1289.1	9.74	9.32	8.93
1279.2	1309.2	9.29	8.84	8.43
1319.5	1349.5	8.33	7.86	7.44
1339.7	1369.7	7.88	7.40	6.98
1380.0	1410.0	7.09	6.63	6.26
1400.1	1430.1	6.71	6.27	5.93

Frequency Mixer

ADE-ED7022/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=500.5MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
10.1	40.1	1.19	1.09	1.05	40.1	1.49	2.25	3.45	10.1	1.83	1.70	1.58
50.4	80.4	1.18	1.08	1.02	80.4	1.49	2.32	3.40	22.4	1.75	1.64	1.54
90.7	120.7	1.18	1.08	1.03	120.7	1.49	2.30	3.35	34.6	1.72	1.59	1.50
131.0	161.0	1.17	1.08	1.05	161.0	1.49	2.30	3.34	46.9	1.75	1.62	1.51
171.4	201.4	1.16	1.08	1.07	201.4	1.50	2.30	3.31	59.1	1.79	1.66	1.54
211.7	241.7	1.16	1.09	1.09	241.7	1.54	2.31	3.30	71.4	1.80	1.66	1.54
252.0	282.0	1.16	1.11	1.11	282.0	1.57	2.34	3.33	83.6	1.80	1.66	1.55
292.3	322.3	1.17	1.14	1.14	322.3	1.62	2.37	3.31	95.9	1.79	1.67	1.55
332.6	362.6	1.16	1.14	1.14	362.6	1.67	2.43	3.41	108.1	1.78	1.65	1.53
372.9	402.9	1.20	1.16	1.19	402.9	1.76	2.50	3.47	120.4	1.80	1.66	1.55
413.2	443.2	1.23	1.19	1.19	443.2	1.80	2.55	3.50	132.6	1.82	1.68	1.57
453.5	483.5	1.24	1.22	1.22	483.5	1.85	2.61	3.60	144.9	1.83	1.69	1.57
493.9	523.9	1.25	1.25	1.27	523.9	1.85	2.55	3.47	157.1	1.83	1.69	1.57
514.0	544.0	1.24	1.27	1.31	544.0	1.87	2.52	3.41	169.4	1.82	1.69	1.57
554.3	584.3	1.24	1.29	1.32	584.3	1.98	2.57	3.42	181.6	1.83	1.70	1.58
574.5	604.5	1.23	1.27	1.30	604.5	2.21	2.79	3.61	193.9	1.87	1.74	1.61
614.8	644.8	1.26	1.23	1.26	644.8	2.31	3.00	3.79	206.1	1.89	1.75	1.63
634.9	664.9	1.31	1.23	1.24	664.9	2.32	3.06	3.92	218.4	1.89	1.76	1.63
675.3	705.3	1.42	1.34	1.29	705.3	2.36	3.11	4.01	230.6	1.87	1.73	1.61
695.4	725.4	1.49	1.41	1.35	725.4	2.33	3.03	3.90	242.9	1.87	1.73	1.61
735.7	765.7	1.71	1.62	1.56	765.7	2.33	3.00	3.85	255.1	1.89	1.75	1.62
755.9	785.9	1.84	1.75	1.68	785.9	2.31	2.93	3.72	267.4	1.90	1.77	1.64
796.2	826.2	2.06	1.96	1.88	826.2	2.25	2.83	3.58	279.6	1.92	1.78	1.66
816.4	846.4	2.17	2.07	1.97	846.4	2.26	2.86	3.62	291.9	1.92	1.78	1.66
856.7	886.7	2.34	2.21	2.12	886.7	2.18	2.77	3.57	304.1	1.91	1.77	1.65
876.8	906.8	2.41	2.27	2.19	906.8	2.17	2.77	3.57	316.4	1.91	1.77	1.65
917.1	947.1	2.51	2.38	2.33	947.1	2.33	2.94	3.72	328.6	1.93	1.80	1.67
937.3	967.3	2.54	2.44	2.40	967.3	2.41	2.96	3.69	340.9	1.96	1.82	1.69
977.6	1007.6	2.64	2.57	2.53	1007.6	2.64	3.10	3.76	353.1	1.96	1.83	1.70
997.8	1027.8	2.68	2.62	2.57	1027.8	2.78	3.21	3.87	365.4	1.96	1.82	1.70
1038.1	1068.1	2.82	2.75	2.69	1068.1	3.03	3.36	3.95	377.6	1.97	1.84	1.71
1058.2	1088.2	2.90	2.82	2.76	1088.2	3.14	3.43	3.96	389.9	2.00	1.86	1.73
1098.5	1128.5	3.04	2.95	2.88	1128.5	3.35	3.56	4.05	402.1	2.03	1.89	1.77
1118.7	1148.7	3.12	3.02	2.95	1148.7	3.46	3.62	4.07	414.4	2.07	1.93	1.80
1159.0	1189.0	3.18	3.11	3.05	1189.0	3.61	3.75	4.13	426.6	2.07	1.93	1.80
1179.2	1209.2	3.19	3.12	3.07	1209.2	3.65	3.80	4.19	438.9	2.04	1.90	1.78
1219.5	1249.5	3.19	3.11	3.07	1249.5	3.68	3.87	4.24	451.1	2.04	1.91	1.78
1239.6	1269.6	3.17	3.08	3.02	1269.6	3.69	3.91	4.28	463.4	2.07	1.93	1.80
1279.9	1309.9	3.13	3.01	2.97	1309.9	3.65	3.91	4.28	487.9	2.12	1.99	1.87
1300.1	1330.1	3.06	2.95	2.91	1330.1	3.58	3.86	4.23	500.1	2.10	1.99	1.88

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	20	25	21	33	18	37	29	45	30	48
1	-	17	0	26	12	31	17	34	31	41	40	47
2	>100	70	57	66	57	65	54	66	50	62	63	72
3	>100	66	68	73	61	75	55	74	55	70	58	75
4	>100	88	77	>89	77	>89	78	83	77	87	84	>89
5	>100	86	81	>89	78	>89	80	>89	78	87	76	87
6	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
7	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
8	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89	>89
9	>100	>89	>89	>89	>89	>89	>89	>89	>89	70	>89	>89
10	>100	>89	>89	>89	>89	>89	>89	>89	>89	>89	77	>89
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -6.00 dBm.
LO IN: 280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -11.36 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	29	35	34	46	31	48	43	59	49	65
1	-	17	0	27	12	34	18	34	32	47	46	54
2	87	71	46	59	47	71	47	61	44	61	57	65
3	>100	41	45	46	46	47	42	45	40	58	51	55
4	>100	67	68	66	68	66	65	63	59	68	56	66
5	>100	75	59	57	51	61	48	57	46	63	47	60
6	>100	82	75	81	75	85	73	>99	70	75	68	73
7	>100	76	73	74	72	68	72	65	65	62	59	61
8	>100	91	88	85	84	88	80	83	80	77	76	74
9	>100	89	80	84	72	73	71	69	71	70	70	70
10	>100	98	93	>99	92	90	84	88	85	92	79	89
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 4.00 dBm.
LO IN: 280.01 MHz; +13.00 dBm
IF OUT: 29.91 MHz; -1.43 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.