

Frequency Mixer

ADE-1+

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=+1dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+4	+7	+10			+4	+7	+10			+4	+7	+10
0.5	30.5	5.85	5.68	5.52	10.1	40.1	16.73	26.25	26.32	10.1	40.1	1.36	1.06	0.83
0.8	30.8	5.71	5.55	5.38	30.1	60.1	21.76	23.53	22.13	30.1	60.1	1.38	1.05	0.82
1.0	31.0	5.69	5.35	5.18	50.1	80.1	21.16	18.27	26.58	50.1	80.1	1.05	1.04	0.83
5.0	35.0	5.22	5.06	4.89	70.1	100.1	21.80	21.99	20.94	70.1	100.1	1.37	0.94	0.77
10.1	40.1	5.12	4.95	4.79	90.1	120.1	23.95	19.81	18.98	90.1	120.1	1.26	0.92	0.75
30.1	60.1	5.18	4.85	4.79	110.1	140.1	18.24	18.96	17.77	110.1	140.1	1.20	0.91	0.69
50.1	80.1	5.21	4.91	4.84	130.1	160.1	20.30	17.78	16.74	130.1	160.1	1.22	0.91	0.73
70.1	100.1	5.17	4.99	4.87	150.1	180.1	26.34	16.58	13.59	150.1	180.1	1.19	0.93	0.71
90.1	120.1	5.23	5.01	4.88	170.1	200.1	23.92	17.31	15.80	170.1	200.1	1.14	0.88	0.70
110.1	140.1	5.26	5.02	4.89	190.1	220.1	14.04	13.07	14.55	190.1	220.1	1.10	0.85	0.71
130.1	160.1	5.25	5.05	4.93	210.1	240.1	13.29	11.75	12.26	210.1	240.1	1.11	0.87	0.69
150.1	180.1	5.32	5.11	4.97	230.1	260.1	15.78	13.53	15.23	230.1	260.1	1.13	0.88	0.72
170.1	200.1	5.35	5.13	4.99	250.1	280.1	14.16	14.41	18.30	250.1	280.1	1.09	0.88	0.71
190.1	220.1	5.36	5.13	5.00	270.1	300.1	12.70	12.80	17.27	270.1	300.1	1.06	0.85	0.71
210.1	240.1	5.36	5.14	5.02	290.1	320.1	12.67	12.69	14.04	290.1	320.1	1.10	0.86	0.71
230.1	260.1	5.43	5.19	5.03	310.1	340.1	12.68	12.46	13.70	310.1	340.1	1.16	0.89	0.75
250.1	280.1	5.53	5.23	5.04	330.1	360.1	12.88	12.68	14.37	330.1	360.1	1.26	1.00	0.83
290.1	320.1	5.61	5.38	5.20	350.1	380.1	13.41	12.14	14.28	350.1	380.1	1.38	1.08	0.88
310.1	340.1	5.62	5.41	5.26	370.1	400.1	13.68	14.71	15.83	370.1	400.1	1.52	1.15	0.93
330.1	360.1	5.65	5.41	5.25	390.1	420.1	12.91	14.81	16.86	390.1	420.1	1.63	1.25	0.98
350.1	380.1	5.66	5.38	5.21	410.1	440.1	9.47	14.16	17.89	410.1	440.1	1.72	1.37	1.09
370.1	400.1	5.67	5.37	5.21	430.1	460.1	6.29	9.96	16.09	430.1	460.1	1.85	1.53	1.26
390.1	420.1	5.76	5.41	5.27	450.1	480.1	5.00	7.35	12.63	450.1	480.1	1.86	1.57	1.33
410.1	440.1	5.97	5.58	5.38	470.1	500.1	4.08	5.93	9.15	470.1	500.1	1.89	1.63	1.46
450.1	480.1	6.36	5.92	5.56	510.1	540.1	4.11	5.19	6.96	510.1	540.1	1.97	1.75	1.62
470.1	500.1	6.47	6.05	5.64	530.1	560.1	4.02	5.10	6.89	530.1	560.1	1.95	1.80	1.66
510.1	540.1	6.82	6.37	5.96	570.1	600.1	5.65	7.76	12.50	570.1	600.1	1.97	1.83	1.64
530.1	560.1	6.95	6.49	6.06	590.1	620.1	7.01	9.84	19.98	590.1	620.1	1.95	1.77	1.60
570.1	600.1	7.04	6.45	5.98	630.1	660.1	9.81	15.42	13.56	630.1	660.1	1.98	1.63	1.48
590.1	620.1	7.01	6.43	5.95	650.1	680.1	10.47	13.29	14.57	650.1	680.1	1.91	1.59	1.39
650.1	680.1	7.01	6.47	6.14	690.1	720.1	10.54	12.28	13.62	690.1	720.1	1.84	1.49	1.27
690.1	720.1	7.23	6.76	6.51	710.1	740.1	10.17	11.76	12.15	710.1	740.1	1.71	1.42	1.22
750.1	780.1	7.61	7.21	7.00	750.1	780.1	10.12	10.44	10.90	750.1	780.1	1.60	1.32	1.15
770.1	800.1	7.80	7.43	7.26	770.1	800.1	9.91	9.71	10.12	770.1	800.1	1.51	1.22	1.03
810.1	840.1	8.29	8.00	7.90	810.1	840.1	9.47	9.66	10.46	810.1	840.1	1.40	1.03	0.83
830.1	860.1	8.61	8.32	8.24	830.1	860.1	9.38	9.80	12.02	830.1	860.1	1.34	0.93	0.74
870.1	900.1	9.42	9.10	8.99	870.1	900.1	10.57	13.11	14.50	870.1	900.1	1.27	0.85	0.68
890.1	920.1	9.86	9.48	9.35	890.1	920.1	10.15	13.15	14.50	890.1	920.1	1.27	0.84	0.68
930.1	960.1	10.71	10.25	10.07	930.1	960.1	10.32	13.90	14.16	930.1	960.1	1.28	0.83	0.72
950.1	980.1	11.18	10.70	10.51	950.1	980.1	10.84	14.37	15.76	950.1	980.1	1.31	0.84	0.74

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Frequency Mixer

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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)
		+7			+7			+7
240.0	10.1	5.29	10.0	20.1	4.84	490.0	10.1	5.96
234.1	16.0	5.28	22.3	32.4	4.85	477.7	22.4	5.89
228.2	21.9	5.19	34.6	44.7	4.86	465.4	34.7	5.84
222.3	27.8	5.19	46.9	57.0	4.87	453.1	47.0	5.85
216.4	33.7	5.17	59.2	69.3	4.80	440.8	59.3	5.90
210.5	39.6	5.14	71.5	81.6	4.78	428.5	71.6	5.85
204.6	45.5	5.16	83.8	93.9	4.79	416.2	83.9	5.84
198.7	51.4	5.10	96.2	106.3	4.80	403.8	96.3	5.81
192.8	57.3	5.12	108.5	118.6	4.79	391.5	108.6	5.79
186.9	63.2	5.09	120.8	130.9	4.79	379.2	120.9	5.81
181.0	69.1	5.11	133.1	143.2	4.81	366.9	133.2	5.85
175.1	75.0	5.13	145.4	155.5	4.87	354.6	145.5	5.82
169.2	80.9	5.12	157.7	167.8	4.89	342.3	157.8	5.82
163.3	86.8	5.13	170.0	180.1	4.92	330.0	170.1	5.84
157.4	92.7	5.14	182.3	192.4	4.91	317.7	182.4	5.86
151.5	98.6	5.12	194.6	204.7	4.92	305.4	194.7	5.87
145.6	104.5	5.13	206.9	217.0	4.94	293.1	207.0	5.84
139.7	110.4	5.13	219.2	229.3	4.96	280.8	219.3	5.83
133.8	116.3	5.12	231.5	241.6	4.97	268.5	231.6	5.87
127.9	122.2	5.09	243.8	253.9	4.95	256.2	243.9	5.89
122.1	128.0	5.09	256.2	266.3	4.98	243.8	256.3	5.91
116.2	133.9	5.11	268.5	278.6	4.99	231.5	268.6	5.90
110.3	139.8	5.11	280.8	290.9	5.03	219.2	280.9	5.86
104.4	145.7	5.12	293.1	303.2	5.11	206.9	293.2	5.89
98.5	151.6	5.12	305.4	315.5	5.13	194.6	305.5	5.87
92.6	157.5	5.12	317.7	327.8	5.20	182.3	317.8	5.85
86.7	163.4	5.12	330.0	340.1	5.19	170.0	330.1	5.87
80.8	169.3	5.14	342.3	352.4	5.16	157.7	342.4	5.86
74.9	175.2	5.13	354.6	364.7	5.18	145.4	354.7	5.85
69.0	181.1	5.14	366.9	377.0	5.15	133.1	367.0	5.81
63.1	187.0	5.12	379.2	389.3	5.08	120.8	379.3	5.74
57.2	192.9	5.12	391.5	401.6	5.03	108.5	391.6	5.69
51.3	198.8	5.13	403.8	413.9	5.00	96.2	403.9	5.68
45.4	204.7	5.14	416.2	426.3	5.01	83.8	416.3	5.64
39.5	210.6	5.16	428.5	438.6	5.06	71.5	428.6	5.65
33.6	216.5	5.16	440.8	450.9	5.13	59.2	440.9	5.71
27.7	222.4	5.16	453.1	463.2	5.16	46.9	453.2	5.79
21.8	228.3	5.18	465.4	475.5	5.17	34.6	465.5	5.91
15.9	234.2	5.19	477.7	487.8	5.17	22.3	477.8	6.01
10.0	240.1	5.24	490.0	500.1	5.18	10.0	490.1	6.18

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
0.5	65.51	67.49	69.34	59.66	56.67	55.50
0.8	65.50	67.50	69.00	59.84	56.83	55.34
1.0	65.66	67.51	69.17	59.50	56.67	55.34
5.0	64.33	66.17	67.84	58.16	55.50	54.00
10.1	63.17	65.17	66.84	57.00	54.17	52.84
30.1	61.42	63.14	64.71	65.38	64.59	62.11
50.1	58.65	60.39	62.34	59.34	59.76	57.83
70.1	56.11	57.91	59.58	56.65	55.35	54.10
90.1	53.98	56.09	58.02	53.97	52.69	51.87
110.1	52.88	55.03	56.90	50.91	50.03	50.24
130.1	52.09	54.50	56.58	48.87	48.71	48.77
150.1	50.80	52.93	54.71	47.19	47.41	47.53
190.1	49.41	51.80	53.79	44.78	45.30	45.95
210.1	48.36	50.38	52.36	43.51	44.10	44.68
230.1	48.29	50.36	52.21	42.87	43.57	43.62
250.1	47.82	49.68	51.30	42.46	43.68	43.63
270.1	48.84	51.24	53.31	41.45	42.36	42.46
290.1	48.69	51.34	53.26	41.23	41.79	41.55
310.1	47.04	49.81	52.26	41.01	40.88	39.93
350.1	44.50	46.74	48.75	38.80	38.74	38.02
370.1	42.38	44.30	46.04	38.62	37.60	36.30
390.1	41.57	43.82	46.36	37.38	36.18	34.66
410.1	41.10	43.35	45.28	35.79	33.84	32.49
450.1	39.95	42.32	44.15	35.42	32.30	30.45
470.1	39.60	41.70	43.46	35.74	31.87	29.42
510.1	40.78	42.73	43.99	35.23	31.77	28.27
530.1	41.49	43.75	44.90	34.92	31.75	28.55
570.1	41.22	42.71	42.14	34.41	30.83	27.54
590.1	39.71	39.77	39.06	33.70	29.53	26.11
650.1	38.21	37.15	36.10	31.60	26.22	23.32
690.1	37.60	36.10	34.81	28.18	24.05	21.46
710.1	37.96	35.31	33.26	26.46	22.79	20.47
750.1	37.68	33.37	30.96	23.63	20.79	18.90
770.1	36.35	32.11	29.59	22.14	19.86	17.97
810.1	32.57	28.90	26.57	19.87	18.28	16.62
830.1	31.16	27.56	25.35	18.99	17.63	16.14
870.1	27.76	25.07	23.04	17.44	16.66	15.34
890.1	25.98	23.66	21.76	16.55	16.15	14.92
930.1	23.96	22.03	20.33	15.35	15.39	14.49
950.1	22.97	21.12	19.60	14.81	15.00	14.25

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	42.08	42.42	45.59
30.1	60.1	35.36	34.69	35.75
50.1	80.1	31.34	30.85	31.08
70.1	100.1	28.45	28.69	28.81
90.1	120.1	26.75	26.93	27.14
110.1	140.1	25.48	25.70	25.78
130.1	160.1	24.46	24.60	24.70
150.1	180.1	23.62	23.78	24.01
170.1	200.1	23.33	23.60	23.73
190.1	220.1	22.98	23.39	23.57
210.1	240.1	22.65	23.00	23.31
230.1	260.1	22.61	23.05	23.43
250.1	280.1	22.68	23.12	23.48
270.1	300.1	22.90	23.21	23.61
290.1	320.1	23.58	23.89	24.22
310.1	340.1	24.11	24.66	25.09
330.1	360.1	24.61	25.46	26.32
350.1	380.1	24.02	25.13	26.06
370.1	400.1	23.26	24.28	25.00
390.1	420.1	22.01	22.76	23.19
410.1	440.1	20.46	20.79	21.01
430.1	460.1	19.51	19.67	19.68
450.1	480.1	18.73	18.81	18.72
470.1	500.1	18.26	18.29	18.25
510.1	540.1	18.10	18.19	18.45
530.1	560.1	18.24	18.42	18.81
570.1	600.1	18.87	19.06	19.24
590.1	620.1	18.80	18.69	18.53
630.1	660.1	17.89	17.35	16.91
650.1	680.1	17.17	16.71	16.47
690.1	720.1	15.89	15.63	15.38
710.1	740.1	15.29	14.98	14.69
750.1	780.1	14.03	13.69	13.26
770.1	800.1	13.19	12.87	12.41
810.1	840.1	11.59	11.26	10.75
830.1	860.1	10.83	10.44	9.94
870.1	900.1	9.46	8.95	8.48
890.1	920.1	8.78	8.34	7.83
930.1	960.1	7.76	7.29	6.89
950.1	980.1	7.26	6.79	6.44

Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+4	+7	+10
0.5	30.5	1.50	1.46	1.45
0.8	30.8	1.38	1.32	1.30
1.0	31.0	1.34	1.29	1.26
5.0	35.0	1.29	1.19	1.12
10.1	40.1	1.29	1.18	1.11
30.1	60.1	1.23	1.15	1.06
50.1	80.1	1.23	1.13	1.07
70.1	100.1	1.19	1.11	1.06
90.1	120.1	1.20	1.10	1.05
110.1	140.1	1.17	1.08	1.03
150.1	180.1	1.17	1.09	1.04
170.1	200.1	1.15	1.06	1.03
190.1	220.1	1.13	1.06	1.04
210.1	240.1	1.12	1.04	1.03
250.1	280.1	1.11	1.05	1.07
270.1	300.1	1.12	1.06	1.08
290.1	320.1	1.11	1.08	1.10
310.1	340.1	1.09	1.09	1.12
350.1	380.1	1.09	1.15	1.20
370.1	400.1	1.10	1.17	1.22
390.1	420.1	1.10	1.17	1.21
410.1	440.1	1.09	1.13	1.18
450.1	480.1	1.17	1.12	1.14
470.1	500.1	1.23	1.17	1.17
510.1	540.1	1.42	1.37	1.33
530.1	560.1	1.54	1.48	1.43
570.1	600.1	1.79	1.71	1.66
590.1	620.1	1.89	1.83	1.78
630.1	660.1	2.16	2.10	2.07
650.1	680.1	2.32	2.26	2.22
690.1	720.1	2.65	2.60	2.55
710.1	740.1	2.80	2.73	2.68
750.1	780.1	2.96	2.88	2.81
770.1	800.1	3.04	2.94	2.86
810.1	840.1	3.18	3.06	2.96
830.1	860.1	3.25	3.11	3.00
870.1	900.1	3.33	3.15	3.03
890.1	920.1	3.35	3.15	3.02
930.1	960.1	3.35	3.12	3.00
950.1	980.1	3.31	3.09	2.96

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+4	+7	+10
0.5	1.69	2.51	3.46
0.8	1.67	2.56	3.57
1.0	1.71	2.56	3.57
5.0	1.67	2.51	3.46
10.1	1.69	2.51	3.46
30.1	1.77	2.64	3.77
50.1	1.75	2.60	3.68
70.1	1.67	2.41	3.37
90.1	1.66	2.37	3.30
110.1	1.69	2.46	3.47
150.1	1.75	2.54	3.52
170.1	1.72	2.46	3.39
190.1	1.73	2.47	3.40
210.1	1.81	2.58	3.56
250.1	1.85	2.62	3.58
270.1	1.87	2.60	3.52
290.1	1.90	2.66	3.60
310.1	1.97	2.77	3.76
350.1	2.02	2.78	3.74
370.1	2.03	2.77	3.70
390.1	2.10	2.84	3.79
410.1	2.21	2.96	3.94
450.1	2.35	3.11	4.04
470.1	2.40	3.18	4.12
510.1	2.54	3.39	4.40
530.1	2.57	3.40	4.41
570.1	2.61	3.42	4.41
590.1	2.66	3.48	4.47
630.1	2.71	3.47	4.42
650.1	2.71	3.45	4.39
690.1	2.80	3.56	4.53
710.1	2.88	3.62	4.57
750.1	3.07	3.74	4.63
770.1	3.21	3.86	4.73
810.1	3.54	4.09	4.87
830.1	3.71	4.18	4.89
870.1	4.06	4.41	5.00
890.1	4.21	4.50	5.03
930.1	4.41	4.61	5.04
950.1	4.43	4.63	5.03

IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1)		
	@LO (dBm)		
	+4	+7	+10
0.1	2.17	1.74	1.49
0.3	2.13	1.74	1.49
0.5	2.20	1.78	1.52
0.8	2.28	1.85	1.55
1.0	2.28	1.85	1.55
5.0	2.24	1.81	1.54
10.0	2.33	1.95	1.75
22.6	2.28	1.97	1.69
35.1	2.19	1.83	1.57
47.7	2.17	1.83	1.55
60.3	2.15	1.82	1.52
85.4	2.19	1.87	1.57
97.9	2.18	1.86	1.58
110.5	2.19	1.87	1.59
123.1	2.19	1.89	1.60
135.6	2.19	1.88	1.59
148.2	2.14	1.85	1.58
173.3	2.12	1.83	1.59
185.9	2.13	1.84	1.60
198.5	2.15	1.87	1.63
211.0	2.15	1.88	1.64
223.6	2.15	1.88	1.65
236.2	2.13	1.87	1.65
248.7	2.13	1.87	1.65
273.8	2.15	1.88	1.67
286.4	2.10	1.86	1.66
299.0	2.06	1.83	1.64
311.5	2.05	1.81	1.62
324.1	2.05	1.82	1.64
336.7	2.04	1.83	1.66
349.2	2.05	1.83	1.67
374.4	2.03	1.82	1.66
386.9	2.01	1.79	1.65
399.5	2.00	1.79	1.63
424.6	1.96	1.78	1.65
437.2	1.96	1.76	1.64
449.7	1.98	1.78	1.64
474.9	1.99	1.80	1.67
487.4	2.00	1.79	1.65
500.0	2.18	2.08	2.06

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	16	37	12	35	12	46	19	40	33	53
1	-	18	+0	25	11	38	22	37	36	49	46	44
2	106	73	51	79	52	83	50	65	50	66	53	80
3	116	72	63	74	62	77	61	78	81	80	73	84
4	109	95	98	96	87	89	86	105	91	102	91	99
5	112	110	95	92	86	86	88	101	87	102	98	103
6	133	98	98	104	98	90	94	86	100	101	102	96
7	121	96	102	104	100	102	99	83	90	98	100	96
8	115	99	99	102	102	93	106	114	78	99	100	102
9	120	114	107	102	100	101	94	101	92	66	107	93
10	113	105	105	104	104	110	97	93	95	89	81	88
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -14.00 dBm.
 LO IN: 280.01 MHz; +7.00 dBm
 IF OUT: 29.91 MHz; -19.35 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	24	51	23	46	24	55	31	52	49	65
1	-	19	+0	27	12	41	24	43	38	54	55	57
2	102	63	43	71	45	62	44	57	44	61	49	66
3	107	45	42	47	44	48	38	50	47	54	54	69
4	111	76	67	72	64	73	64	77	59	69	58	70
5	119	67	64	59	52	66	51	65	51	66	66	73
6	112	89	84	107	81	91	80	94	82	78	80	82
7	110	92	83	85	73	70	71	69	68	69	63	71
8	113	94	109	95	95	94	89	88	83	88	83	87
9	111	86	107	102	88	90	75	82	77	70	76	92
10	110	101	104	102	101	104	96	97	93	95	83	96
	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; +7.00 dBm
 IF OUT: 29.91 MHz; -9.37 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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