

Frequency Mixer

ADE-4

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+4	+7	+10
20.1	50.1	16.10	9.82	7.27
60.1	90.1	9.81	7.49	6.57
100.1	130.1	7.89	6.76	6.39
140.1	170.1	7.85	6.87	6.49
180.1	210.1	7.42	6.60	6.34
220.1	250.1	7.38	6.61	6.39
260.1	290.1	7.12	6.61	6.41
300.1	330.1	6.96	6.51	6.32
340.1	370.1	7.08	6.63	6.43
380.1	410.1	6.85	6.54	6.41
420.1	450.1	6.90	6.49	6.29
480.1	510.1	6.88	6.54	6.33
520.1	550.1	6.97	6.61	6.39
580.1	610.1	6.83	6.49	6.29
620.1	650.1	6.89	6.55	6.36
680.1	710.1	6.87	6.52	6.29
720.1	750.1	6.99	6.64	6.42
780.1	810.1	7.05	6.72	6.51
820.1	850.1	7.18	6.78	6.54
880.1	910.1	7.17	6.63	6.33
920.1	950.1	7.28	6.75	6.38
980.1	1010.1	7.24	6.76	6.42
1020.1	1050.1	7.17	6.71	6.38
1080.1	1110.1	7.14	6.69	6.39
1120.1	1150.1	7.05	6.63	6.33
1180.1	1210.1	6.83	6.41	6.11
1220.1	1250.1	6.74	6.30	6.04
1280.1	1310.1	6.74	6.30	6.07
1320.1	1350.1	6.85	6.37	6.13
1380.1	1410.1	7.15	6.62	6.32
1420.1	1450.1	7.36	6.82	6.51
1480.1	1510.1	7.60	7.14	6.82
1520.1	1550.1	7.86	7.46	7.13
1580.1	1610.1	8.30	8.00	7.73
1620.1	1650.1	8.53	8.28	8.05
1680.1	1710.1	8.89	8.71	8.55
1720.1	1750.1	9.08	8.92	8.78
1780.1	1810.1	9.57	9.41	9.31
1820.1	1850.1	9.83	9.66	9.55
1880.1	1910.1	10.49	10.31	10.17

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+4	+7	+10
20.1	50.1	-3.37	4.00	10.62
60.1	90.1	5.33	11.61	16.79
100.1	130.1	10.27	14.73	15.61
140.1	170.1	11.93	16.60	15.14
180.1	210.1	12.13	12.99	18.36
220.1	250.1	13.45	13.87	22.68
260.1	290.1	11.33	16.49	22.37
300.1	330.1	11.09	18.12	21.86
340.1	370.1	12.39	19.68	18.40
380.1	410.1	14.62	19.92	17.12
420.1	450.1	14.25	20.48	19.23
480.1	510.1	15.84	19.19	18.06
520.1	550.1	16.51	15.65	15.02
580.1	610.1	15.25	14.94	14.93
620.1	650.1	13.75	13.85	14.43
680.1	710.1	16.60	14.95	14.64
720.1	750.1	16.30	17.30	16.91
780.1	810.1	15.10	15.97	16.79
820.1	850.1	14.00	14.99	15.69
880.1	910.1	13.49	12.68	13.96
920.1	950.1	13.50	13.09	13.06
980.1	1010.1	13.00	13.18	12.80
1020.1	1050.1	11.57	11.93	11.74
1080.1	1110.1	8.90	9.53	9.60
1120.1	1150.1	7.93	8.45	8.75
1180.1	1210.1	7.13	8.06	8.76
1220.1	1250.1	7.34	8.93	9.77
1280.1	1310.1	7.03	8.76	9.89
1320.1	1350.1	6.84	8.49	9.94
1380.1	1410.1	6.41	8.02	9.82
1420.1	1450.1	6.39	7.94	9.83
1480.1	1510.1	6.35	7.89	9.95
1520.1	1550.1	6.24	7.55	9.64
1580.1	1610.1	6.11	7.05	8.76
1620.1	1650.1	6.33	6.92	8.32
1680.1	1710.1	7.80	7.90	8.85
1720.1	1750.1	9.34	8.89	9.43
1780.1	1810.1	12.99	12.06	11.58
1820.1	1850.1	14.92	14.25	13.35
1880.1	1910.1	13.74	17.42	17.11

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB)		
		@LO (dBm)		
		+4	+7	+10
20.1	50.1	-3.15	-0.42	0.09
60.1	90.1	-0.16	0.22	0.24
100.1	130.1	0.49	0.44	0.29
140.1	170.1	0.36	0.32	0.22
180.1	210.1	0.49	0.38	0.22
220.1	250.1	0.52	0.34	0.16
260.1	290.1	0.56	0.34	0.21
300.1	330.1	0.60	0.39	0.25
340.1	370.1	0.50	0.33	0.17
380.1	410.1	0.60	0.38	0.22
420.1	450.1	0.56	0.36	0.26
480.1	510.1	0.54	0.38	0.28
520.1	550.1	0.50	0.35	0.26
580.1	610.1	0.64	0.46	0.35
620.1	650.1	0.63	0.46	0.35
680.1	710.1	0.77	0.59	0.46
720.1	750.1	0.78	0.59	0.46
780.1	810.1	0.92	0.69	0.54
820.1	850.1	0.96	0.73	0.58
880.1	910.1	1.12	0.98	0.81
920.1	950.1	1.10	0.99	0.86
980.1	1010.1	1.26	1.07	0.96
1020.1	1050.1	1.34	1.18	1.03
1080.1	1110.1	1.43	1.23	1.09
1120.1	1150.1	1.55	1.32	1.17
1180.1	1210.1	1.81	1.52	1.28
1220.1	1250.1	1.90	1.56	1.28
1280.1	1310.1	2.00	1.63	1.31
1320.1	1350.1	1.94	1.61	1.28
1380.1	1410.1	1.86	1.59	1.28
1420.1	1450.1	1.72	1.52	1.26
1480.1	1510.1	1.73	1.52	1.31
1520.1	1550.1	1.55	1.37	1.21
1580.1	1610.1	1.32	1.14	1.02
1620.1	1650.1	1.16	0.97	0.84
1680.1	1710.1	0.97	0.77	0.64
1720.1	1750.1	0.89	0.67	0.55
1780.1	1810.1	0.75	0.55	0.43
1820.1	1850.1	0.69	0.52	0.39
1880.1	1910.1	0.52	0.39	0.30

Frequency Mixer

ADE-4

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=389.9MHz (dB)
		@LO (dBm)
		+7
10.1	400.0	6.9
12.6	402.5	6.9
15.1	405.0	6.9
17.6	407.5	6.9
20.1	410.0	6.8
22.6	412.5	6.8
25.1	415.0	6.8
27.6	417.5	6.8
30.1	420.0	6.9
32.6	422.5	6.9
35.1	425.0	6.9
37.6	427.5	6.9
40.1	430.0	6.9
42.6	432.5	6.9
45.1	435.0	6.9
47.6	437.5	6.9
50.1	440.0	6.9
52.6	442.5	6.9
55.1	445.0	7.0
57.6	447.5	6.9
60.1	450.0	6.9
62.6	452.5	6.9
65.1	455.0	6.9
67.6	457.5	6.9
70.1	460.0	6.9
72.6	462.5	6.9
75.1	465.0	6.9
77.6	467.5	6.9
80.1	470.0	6.9
82.6	472.5	6.9
85.1	475.0	6.9
87.6	477.5	6.9
90.1	480.0	6.9
92.6	482.5	6.9
95.1	485.0	7.0
97.6	487.5	7.0
100.1	490.0	7.0
102.6	492.5	7.0
107.6	497.5	6.9
110.1	500.0	7.0

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=189.9MHz (dB)
		@LO (dBm)
		+7
10.1	200.0	6.61
50.1	240.0	6.61
90.1	280.0	6.63
130.1	320.0	6.65
170.1	360.0	6.67
210.1	400.0	6.72
250.1	440.0	6.76
290.1	480.0	6.81
330.1	520.0	6.91
370.1	560.0	6.96
410.1	600.0	7.06
450.1	640.0	7.01
490.1	680.0	7.05
530.1	720.0	7.14
570.1	760.0	7.21
610.1	800.0	7.36
650.1	840.0	7.53
690.1	880.0	7.60
730.1	920.0	7.67
770.1	960.0	7.72
810.1	1000.0	7.76
850.1	1040.0	7.71
890.1	1080.0	7.71
930.1	1120.0	7.72
970.1	1160.0	7.65
1010.1	1200.0	7.65
1050.1	1240.0	7.74
1090.1	1280.0	7.84
1130.1	1320.0	7.97
1170.1	1360.0	8.10
1210.1	1400.0	8.23
1250.1	1440.0	8.27
1290.1	1480.0	8.45
1330.1	1520.0	8.58
1370.1	1560.0	8.70
1410.1	1600.0	8.91
1450.1	1640.0	9.07
1510.1	1700.0	9.41
1550.1	1740.0	9.60
1610.1	1800.0	9.92

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1010.1MHz (dB)
		@LO (dBm)
		+7
970.1	40.0	11.54
950.1	60.0	9.03
930.1	80.0	7.91
910.1	100.0	7.37
890.1	120.0	7.16
870.1	140.0	7.03
850.1	160.0	7.03
830.1	180.0	6.95
810.1	200.0	6.90
790.1	220.0	6.83
770.1	240.0	6.81
750.1	260.0	6.83
730.1	280.0	6.79
710.1	300.0	6.78
690.1	320.0	6.70
670.1	340.0	6.67
650.1	360.0	6.63
630.1	380.0	6.60
610.1	400.0	6.57
590.1	420.0	6.51
570.1	440.0	6.47
550.1	460.0	6.49
510.1	500.0	6.54
490.1	520.0	6.53
450.1	560.0	6.58
430.1	580.0	6.66
390.1	620.0	6.61
370.1	640.0	6.63
330.1	680.0	6.66
310.1	700.0	6.69
270.1	740.0	6.78
250.1	760.0	6.84
210.1	800.0	6.84
190.1	820.0	6.79
150.1	860.0	6.74
130.1	880.0	6.63
90.1	920.0	6.55
70.1	940.0	6.60
30.1	980.0	6.64
10.1	1000.0	6.69

REV. X3

ADE-4

101013

Page 2 of 5



P.O. Box 350166, Brooklyn, New York 11235-0066 (718) 934-4500 Fax (718) 332-4851 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS



Frequency Mixer

ADE-4

Typical Performance Data

LO	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)					@LO (dBm)		
	+4	+7	+10	+4	+7	+10			+4	+7	+10
50.1	65.35	67.43	69.20	69.90	60.14	57.65	20.1	50.1	43.97	44.42	45.24
90.1	61.74	68.56	76.50	55.88	53.56	52.10	60.1	90.1	36.59	35.50	35.72
130.1	62.03	68.61	76.37	52.32	50.25	48.50	100.1	130.1	31.62	32.48	32.37
170.1	57.58	65.05	72.91	50.59	48.14	46.50	140.1	170.1	29.99	30.19	30.49
210.1	56.10	63.48	70.78	48.52	46.66	44.82	180.1	210.1	28.40	28.85	28.85
250.1	53.43	61.35	68.67	47.91	45.93	43.62	220.1	250.1	26.99	27.81	27.90
290.1	52.25	60.84	65.50	47.26	44.93	42.62	260.1	290.1	26.82	27.37	27.37
330.1	51.20	59.48	64.14	46.50	43.73	41.33	300.1	330.1	26.36	26.90	27.14
370.1	50.39	58.82	61.86	46.00	43.02	40.54	340.1	370.1	26.00	26.47	26.79
410.1	49.85	58.25	59.67	44.88	41.80	39.53	380.1	410.1	26.00	26.78	26.99
450.1	48.65	56.32	58.39	43.61	40.79	38.78	420.1	450.1	26.21	27.18	27.78
510.1	47.86	54.37	55.20	42.44	39.83	37.97	480.1	510.1	26.37	27.14	27.44
550.1	47.41	53.02	52.95	41.43	39.06	37.17	520.1	550.1	25.16	25.83	26.17
610.1	47.62	52.04	50.76	40.56	38.54	36.89	580.1	610.1	24.16	24.95	25.54
650.1	47.22	50.82	49.49	39.65	37.60	36.19	620.1	650.1	23.68	24.50	24.99
710.1	46.45	49.02	47.53	38.44	36.49	34.88	680.1	710.1	21.68	21.74	21.70
750.1	46.26	48.40	46.46	37.44	36.19	34.68	720.1	750.1	19.85	19.63	19.44
810.1	45.28	46.83	44.82	35.48	34.62	33.93	780.1	810.1	17.07	16.74	16.48
850.1	44.58	46.10	43.92	34.29	33.29	32.71	820.1	850.1	15.52	15.20	14.89
910.1	43.39	44.67	42.33	33.05	31.70	30.86	880.1	910.1	14.04	13.58	13.44
950.1	42.16	44.48	42.05	32.50	31.04	29.91	920.1	950.1	13.40	13.01	12.77
1010.1	40.60	43.94	42.67	32.11	30.51	29.27	980.1	1010.1	12.65	12.45	12.22
1050.1	39.79	43.03	42.51	31.59	30.18	28.95	1020.1	1050.1	12.19	12.01	11.94
1110.1	38.86	41.71	41.78	31.10	29.96	28.91	1080.1	1110.1	11.76	11.54	11.48
1150.1	38.22	40.93	41.04	30.59	29.77	28.83	1120.1	1150.1	11.53	11.36	11.29
1210.1	37.40	40.05	40.15	29.49	29.25	28.55	1180.1	1210.1	11.04	10.82	10.68
1250.1	36.99	39.46	39.50	28.34	28.31	27.77	1220.1	1250.1	10.78	10.58	10.45
1310.1	35.98	38.32	38.88	26.80	26.69	26.43	1280.1	1310.1	10.71	10.46	10.24
1350.1	35.12	37.32	38.05	26.04	25.79	25.44	1320.1	1350.1	10.57	10.33	10.11
1410.1	34.29	36.15	36.94	25.63	25.16	24.72	1380.1	1410.1	10.32	10.01	9.81
1450.1	33.70	35.40	36.24	25.34	24.69	24.28	1420.1	1450.1	9.97	9.73	9.45
1510.1	32.55	34.10	34.99	24.93	24.32	23.82	1480.1	1510.1	9.32	9.08	8.83
1550.1	31.72	33.14	34.09	24.57	24.12	23.60	1520.1	1550.1	8.90	8.63	8.38
1610.1	30.51	31.67	32.48	24.36	23.96	23.48	1580.1	1610.1	8.06	7.75	7.52
1650.1	29.59	30.52	31.16	24.04	23.75	23.22	1620.1	1650.1	7.43	7.12	6.84
1710.1	28.87	29.41	29.64	24.06	23.89	23.21	1680.1	1710.1	6.84	6.49	6.22
1750.1	28.48	28.83	28.95	23.72	23.60	23.10	1720.1	1750.1	6.39	6.05	5.77
1810.1	28.04	28.31	28.32	23.32	23.48	23.12	1780.1	1810.1	5.84	5.57	5.34
1850.1	27.68	27.89	27.86	23.03	23.34	23.11	1820.1	1850.1	5.39	5.08	4.87
1910.1	27.40	27.54	27.40	22.73	23.24	23.11	1880.1	1910.1	4.95	4.76	4.51

Frequency Mixer

ADE-4

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1000MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
20.1	50.1	2.32	1.77	1.47	50.1	28.03	22.00	13.09	10.0	1.30	1.13	1.01
60.1	90.1	1.97	1.65	1.44	90.1	9.08	6.15	4.96	30.0	1.32	1.15	1.02
100.1	130.1	1.66	1.46	1.33	130.1	4.72	3.79	3.76	50.0	1.34	1.17	1.04
140.1	170.1	1.61	1.47	1.33	170.1	3.54	3.01	3.16	70.0	1.33	1.16	1.03
180.1	210.1	1.60	1.44	1.36	210.1	2.95	2.74	3.05	90.0	1.32	1.15	1.03
220.1	250.1	1.53	1.40	1.34	250.1	2.67	2.49	2.87	110.0	1.34	1.17	1.04
260.1	290.1	1.53	1.42	1.37	290.1	2.46	2.37	2.83	130.0	1.33	1.16	1.03
300.1	330.1	1.49	1.41	1.37	330.1	2.28	2.30	2.84	150.0	1.35	1.18	1.05
340.1	370.1	1.51	1.43	1.40	370.1	2.18	2.24	2.79	170.0	1.33	1.17	1.04
380.1	410.1	1.49	1.43	1.40	410.1	2.05	2.20	2.82	190.0	1.35	1.18	1.05
420.1	450.1	1.48	1.42	1.39	450.1	1.97	2.18	2.82	210.0	1.34	1.18	1.05
480.1	510.1	1.51	1.46	1.43	510.1	1.87	2.19	2.88	230.0	1.34	1.18	1.05
520.1	550.1	1.50	1.45	1.42	550.1	1.82	2.18	2.89	250.0	1.35	1.18	1.05
580.1	610.1	1.49	1.44	1.41	610.1	1.77	2.22	2.96	270.0	1.37	1.20	1.07
620.1	650.1	1.46	1.42	1.39	650.1	1.76	2.23	2.98	290.0	1.36	1.19	1.07
680.1	710.1	1.45	1.41	1.38	710.1	1.74	2.27	3.05	310.0	1.38	1.21	1.08
720.1	750.1	1.44	1.41	1.38	750.1	1.75	2.30	3.08	330.0	1.37	1.20	1.07
780.1	810.1	1.43	1.40	1.39	810.1	1.75	2.36	3.16	350.0	1.39	1.23	1.10
820.1	850.1	1.43	1.39	1.37	850.1	1.77	2.40	3.20	370.0	1.38	1.21	1.09
880.1	910.1	1.40	1.35	1.32	910.1	1.79	2.45	3.27	390.0	1.39	1.23	1.11
920.1	950.1	1.39	1.33	1.29	950.1	1.84	2.51	3.34	410.0	1.40	1.24	1.11
980.1	1010.1	1.33	1.27	1.23	1010.1	1.89	2.58	3.43	430.0	1.43	1.27	1.14
1020.1	1050.1	1.31	1.25	1.20	1050.1	1.94	2.66	3.52	450.0	1.40	1.24	1.12
1080.1	1110.1	1.23	1.17	1.12	1110.1	2.00	2.73	3.60	470.0	1.43	1.27	1.15
1120.1	1150.1	1.21	1.16	1.11	1150.1	2.05	2.80	3.68	490.0	1.42	1.27	1.15
1180.1	1210.1	1.15	1.11	1.09	1210.1	2.10	2.84	3.71	510.0	1.45	1.30	1.18
1220.1	1250.1	1.18	1.14	1.13	1250.1	2.16	2.92	3.80	530.0	1.44	1.29	1.19
1280.1	1310.1	1.25	1.25	1.26	1310.1	2.24	2.99	3.86	550.0	1.44	1.29	1.18
1320.1	1350.1	1.31	1.30	1.31	1350.1	2.33	3.11	4.00	570.0	1.46	1.31	1.20
1380.1	1410.1	1.45	1.45	1.46	1410.1	2.41	3.19	4.07	590.0	1.48	1.34	1.22
1420.1	1450.1	1.51	1.50	1.51	1450.1	2.52	3.32	4.22	610.0	1.50	1.36	1.26
1480.1	1510.1	1.70	1.70	1.69	1510.1	2.57	3.37	4.25	630.0	1.46	1.33	1.23
1520.1	1550.1	1.74	1.75	1.74	1550.1	2.68	3.50	4.40	650.0	1.49	1.35	1.25
1580.1	1610.1	1.90	1.93	1.94	1610.1	2.73	3.53	4.41	670.0	1.48	1.34	1.24
1620.1	1650.1	1.88	1.92	1.95	1650.1	2.84	3.66	4.55	690.0	1.51	1.39	1.30
1680.1	1710.1	1.96	2.00	2.04	1710.1	2.89	3.68	4.55	710.0	1.48	1.35	1.27
1720.1	1750.1	1.94	1.97	2.00	1750.1	3.01	3.82	4.70	730.0	1.51	1.39	1.31
1780.1	1810.1	2.03	2.04	2.06	1810.1	3.06	3.82	4.66	750.0	1.46	1.35	1.27
1820.1	1850.1	2.01	2.01	2.02	1850.1	3.19	3.96	4.83	790.0	1.47	1.36	1.29
1880.1	1910.1	2.06	2.05	2.04	1910.1	3.23	3.96	4.78	810.0	1.49	1.39	1.32

Frequency Mixer

ADE-4

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	23	13	27	20	28	34	35	34	43
1	-	18	0	25	13	49	27	37	48	36	51	45
2	51	60	52	57	52	71	52	68	61	82	64	69
3	39	70	72	66	67	67	65	71	100	75	80	75
4	73	87	88	86	94	84	98	94	85	81	89	97
5	61	92	94	81	85	89	98	98	98	84	92	91
6	78	92	86	92	103	93	86	97	86	104	95	93
7	73	82	86	96	90	96	88	90	87	83	89	92
8	90	86	89	82	82	85	89	90	97	102	87	88
9	94	86	92	86	86	98	86	95	91	85	89	93
10	100	92	90	91	100	87	89	100	88	95	89	109
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 600 MHz; -14 dBm
LO IN: 630 MHz; +7.00 dBm
IF OUT: 30 MHz; -26.68 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	18	33	25	37	32	39	45	49	46	59
1	-	18	0	24	13	47	28	42	48	41	65	51
2	51	51	42	49	41	70	44	62	53	64	59	66
3	39	50	48	48	48	49	50	55	58	55	67	54
4	73	69	63	64	77	65	74	70	64	68	71	76
5	61	71	67	66	58	68	59	68	60	68	73	83
6	78	107	89	81	86	73	76	75	74	83	74	85
7	73	92	93	85	84	87	85	77	90	76	99	84
8	90	106	98	98	97	91	90	94	87	85	89	107
9	94	95	103	107	89	91	106	95	89	87	86	95
10	100	99	93	96	99	93	92	97	95	105	97	92
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 600 MHz; -4 dBm
LO IN: 630 MHz; +7.00 dBm
IF OUT: 30 MHz; -10.68 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.

REV. X3
ADE-4
101013
Page 5 of 5