

Frequency Mixer

ADE-5X

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
10.1	40.1	5.94	5.32	5.48	10.1	40.1	19.58	17.88	17.02	10.1	40.1	1.36	1.09	0.71
50.1	80.1	6.39	5.94	5.72	50.1	80.1	13.42	14.17	14.49	50.1	80.1	1.25	0.89	0.58
90.1	120.1	6.17	5.82	5.63	90.1	120.1	13.46	13.88	17.68	90.1	120.1	1.38	0.95	0.68
130.1	160.1	6.36	5.96	5.75	130.1	160.1	11.02	13.46	21.13	130.1	160.1	1.26	0.85	0.64
170.1	200.1	6.32	5.93	5.73	170.1	200.1	11.85	19.03	16.97	170.1	200.1	1.42	1.01	0.77
210.1	240.1	6.39	5.99	5.80	210.1	240.1	13.94	17.72	14.27	210.1	240.1	1.33	0.95	0.72
250.1	280.1	6.63	6.18	5.94	250.1	280.1	13.42	13.86	12.83	250.1	280.1	1.32	0.97	0.75
310.1	340.1	6.52	6.11	5.90	310.1	340.1	14.37	12.11	12.53	310.1	340.1	1.44	1.09	0.84
350.1	380.1	6.59	6.19	5.97	350.1	380.1	13.43	12.02	12.84	350.1	380.1	1.49	1.16	0.92
410.1	440.1	6.58	6.17	5.95	410.1	440.1	10.92	11.44	12.44	410.1	440.1	1.54	1.22	1.01
450.1	480.1	6.60	6.16	5.93	450.1	480.1	8.92	9.90	11.66	450.1	480.1	1.63	1.31	1.11
510.1	540.1	6.74	6.32	6.10	510.1	540.1	8.00	8.99	10.40	510.1	540.1	1.56	1.29	1.10
550.1	580.1	6.74	6.36	6.14	550.1	580.1	7.68	9.10	10.73	550.1	580.1	1.58	1.31	1.15
610.1	640.1	6.92	6.54	6.32	610.1	640.1	6.75	8.55	10.53	610.1	640.1	1.46	1.21	1.07
650.1	680.1	6.79	6.45	6.25	650.1	680.1	6.63	7.99	9.81	650.1	680.1	1.54	1.26	1.13
710.1	740.1	6.74	6.44	6.26	710.1	740.1	7.16	7.50	8.54	710.1	740.1	1.57	1.29	1.12
750.1	780.1	6.54	6.26	6.13	750.1	780.1	8.54	8.78	8.91	750.1	780.1	1.66	1.37	1.17
810.1	840.1	6.55	6.23	6.06	810.1	840.1	9.07	10.32	10.62	810.1	840.1	1.54	1.32	1.15
850.1	880.1	6.37	6.06	5.93	850.1	880.1	9.21	11.61	12.97	850.1	880.1	1.67	1.44	1.24
910.1	940.1	6.44	6.03	5.85	910.1	940.1	10.90	14.74	15.90	910.1	940.1	1.48	1.34	1.21
950.1	980.1	6.50	6.05	5.85	950.1	980.1	10.29	13.96	16.29	950.1	980.1	1.37	1.25	1.14
1010.1	1040.1	6.72	6.25	5.99	1010.1	1040.1	7.53	9.43	11.13	1010.1	1040.1	1.05	0.90	0.80
1050.1	1080.1	6.71	6.27	6.03	1050.1	1080.1	6.48	7.80	9.15	1050.1	1080.1	1.04	0.80	0.67
1110.1	1140.1	6.65	6.25	6.02	1110.1	1140.1	6.72	7.61	8.98	1110.1	1140.1	1.09	0.77	0.60
1150.1	1180.1	6.69	6.30	6.06	1150.1	1180.1	6.56	7.26	8.50	1150.1	1180.1	1.08	0.75	0.56
1210.1	1240.1	6.72	6.37	6.14	1210.1	1240.1	6.75	7.35	8.40	1210.1	1240.1	1.13	0.76	0.55
1250.1	1280.1	6.80	6.44	6.22	1250.1	1280.1	6.53	7.00	7.90	1250.1	1280.1	1.12	0.75	0.54
1310.1	1340.1	7.00	6.64	6.43	1310.1	1340.1	6.40	7.15	8.08	1310.1	1340.1	1.10	0.73	0.52
1350.1	1380.1	7.16	6.79	6.58	1350.1	1380.1	6.20	7.17	8.20	1350.1	1380.1	1.09	0.72	0.51
1410.1	1440.1	7.40	7.04	6.81	1410.1	1440.1	5.87	7.29	8.70	1410.1	1440.1	1.02	0.67	0.47
1450.1	1480.1	7.62	7.26	7.03	1450.1	1480.1	6.16	7.86	9.49	1450.1	1480.1	1.03	0.68	0.48
1510.1	1540.1	7.93	7.54	7.28	1510.1	1540.1	7.45	10.85	13.46	1510.1	1540.1	0.93	0.60	0.40
1550.1	1580.1	8.15	7.77	7.55	1550.1	1580.1	9.62	12.14	14.40	1550.1	1580.1	1.00	0.62	0.39
1610.1	1640.1	8.42	8.03	7.86	1610.1	1640.1	9.71	11.14	15.93	1610.1	1640.1	0.91	0.51	0.27
1650.1	1680.1	8.71	8.39	8.26	1650.1	1680.1	9.17	11.09	15.29	1650.1	1680.1	0.89	0.46	0.24
1710.1	1740.1	9.11	8.84	8.77	1710.1	1740.1	9.53	12.00	15.63	1710.1	1740.1	0.76	0.36	0.21
1750.1	1780.1	9.51	9.29	9.25	1750.1	1780.1	10.45	12.40	15.24	1750.1	1780.1	0.71	0.34	0.21
1810.1	1840.1	10.04	9.86	9.84	1810.1	1840.1	11.46	12.62	14.36	1810.1	1840.1	0.60	0.32	0.21
1850.1	1880.1	10.46	10.26	10.23	1850.1	1880.1	11.85	12.55	13.52	1850.1	1880.1	0.62	0.34	0.21
1910.1	1940.1	11.06	10.81	10.73	1910.1	1940.1	11.50	13.36	13.94	1910.1	1940.1	0.56	0.29	0.16

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=750.1MHz (dB)
		@LO (dBm)
		+7
740.0	10.1	6.51
720.0	30.1	6.48
700.0	50.1	6.54
680.0	70.1	6.54
660.0	90.1	6.58
640.0	110.1	6.56
620.0	130.1	6.56
600.0	150.1	6.55
580.0	170.1	6.58
560.0	190.1	6.51
540.0	210.1	6.41
520.0	230.1	6.41
500.0	250.1	6.58
480.0	270.1	6.48
460.0	290.1	6.42
440.0	310.1	6.37
420.0	330.1	6.34
400.0	350.1	6.32
380.0	370.1	6.43
360.0	390.1	6.42
340.0	410.1	6.49
320.0	430.1	6.54
300.0	450.1	6.49
280.0	470.1	6.49
260.0	490.1	6.52
240.0	510.1	6.45
220.0	530.1	6.58
200.0	550.1	6.54
180.0	570.1	6.50
160.0	590.1	6.42
140.0	610.1	6.43
130.0	620.1	6.49
110.0	640.1	6.43
100.0	650.1	6.47
80.0	670.1	6.44
70.0	680.1	6.35
50.0	700.1	6.36
40.0	710.1	6.32
20.0	730.1	6.31
10.0	740.1	6.50

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB)
		@LO (dBm)
		+7
10.0	20.1	5.90
50.0	60.1	5.56
90.0	100.1	5.36
130.0	140.1	5.59
170.0	180.1	5.64
210.0	220.1	5.42
250.0	260.1	5.67
290.0	300.1	5.68
330.0	340.1	5.56
370.0	380.1	5.41
410.0	420.1	5.40
450.0	460.1	5.33
490.0	500.1	5.52
530.0	540.1	5.61
570.0	580.1	5.64
610.0	620.1	5.79
650.0	660.1	5.70
690.0	700.1	5.68
730.0	740.1	5.71
770.0	780.1	5.96
810.0	820.1	5.78
850.0	860.1	6.03
890.0	900.1	6.10
930.0	940.1	6.13
970.0	980.1	6.06
990.0	1000.1	6.17
1030.0	1040.1	6.42
1050.0	1060.1	6.20
1090.0	1100.1	6.82
1110.0	1120.1	6.95
1150.0	1160.1	7.45
1170.0	1180.1	7.66
1210.0	1220.1	8.14
1230.0	1240.1	8.46
1270.0	1280.1	9.02
1290.0	1300.1	9.17
1330.0	1340.1	9.74
1350.0	1360.1	9.81
1390.0	1400.1	10.04
1410.0	1420.1	10.32

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1500.1MHz (dB)
		@LO (dBm)
		+7
1490.0	10.1	11.64
1450.0	50.1	10.93
1410.0	90.1	10.31
1370.0	130.1	9.58
1330.0	170.1	9.22
1290.0	210.1	8.77
1250.0	250.1	8.46
1210.0	290.1	8.17
1170.0	330.1	7.91
1130.0	370.1	7.66
1090.0	410.1	7.44
1050.0	450.1	7.33
1010.0	490.1	7.18
970.0	530.1	7.02
930.0	570.1	6.90
890.0	610.1	6.85
850.0	650.1	6.76
810.0	690.1	6.79
770.0	730.1	6.73
730.0	770.1	6.72
690.0	810.1	6.93
650.0	850.1	6.94
610.0	890.1	6.94
570.0	930.1	6.96
530.0	970.1	6.99
490.0	1010.1	7.02
450.0	1050.1	7.12
410.0	1090.1	7.06
370.0	1130.1	6.93
330.0	1170.1	7.08
290.0	1210.1	7.16
250.0	1250.1	7.17
210.0	1290.1	7.21
190.0	1310.1	7.22
150.0	1350.1	7.23
130.0	1370.1	7.22
90.0	1410.1	7.21
70.0	1430.1	7.24
30.0	1470.1	7.36
10.0	1490.1	7.54

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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
40.1	62.30	58.97	57.91	61.43	62.00	62.52
80.1	65.34	62.54	60.17	56.49	57.40	58.21
120.1	69.49	63.84	60.77	53.07	54.05	55.09
160.1	80.62	66.74	61.87	50.41	51.62	52.71
200.1	66.04	70.19	62.94	48.46	49.76	50.95
240.1	59.59	61.87	60.04	46.79	48.10	49.11
280.1	55.17	57.11	57.41	45.24	46.43	47.41
340.1	49.98	52.08	53.06	43.64	44.93	45.92
380.1	47.37	49.34	51.18	42.29	43.43	44.36
440.1	44.44	46.61	48.38	41.21	42.30	43.16
480.1	42.36	43.83	45.54	40.60	41.79	42.68
540.1	40.57	42.65	43.95	39.24	40.21	40.97
580.1	39.24	41.62	43.75	38.62	39.44	39.99
640.1	37.52	39.02	40.54	37.41	38.51	39.32
680.1	36.71	38.07	39.38	36.80	37.89	38.75
740.1	35.75	37.18	38.13	35.93	37.14	38.05
780.1	34.83	36.41	37.33	35.21	36.26	37.25
840.1	33.35	35.00	36.03	34.80	35.85	36.69
880.1	32.51	34.13	35.37	34.66	35.75	36.50
940.1	30.64	31.77	32.93	34.00	35.02	35.67
980.1	30.02	31.01	32.18	33.57	34.58	35.13
1040.1	28.96	29.74	30.69	32.68	33.52	34.04
1080.1	29.06	29.80	30.70	32.30	32.96	33.43
1140.1	28.54	29.28	30.13	31.61	32.04	32.41
1180.1	28.50	29.26	30.09	31.23	31.56	31.88
1240.1	28.34	29.25	30.06	30.62	30.94	31.22
1280.1	28.37	29.36	30.17	30.03	30.34	30.65
1340.1	28.91	30.35	31.41	29.26	29.44	29.77
1380.1	29.05	30.68	31.93	28.98	29.07	29.30
1440.1	28.55	30.21	31.61	29.14	29.14	29.23
1480.1	27.53	28.96	30.27	28.80	28.87	28.98
1540.1	27.02	28.25	29.44	28.17	28.28	28.47
1580.1	26.86	28.10	29.34	27.84	28.00	28.23
1640.1	27.12	28.39	29.60	27.20	27.47	27.76
1680.1	27.47	28.71	29.79	27.25	27.51	27.73
1740.1	28.47	29.58	30.49	27.12	27.30	27.50
1780.1	29.08	30.04	30.73	27.44	27.54	27.64
1840.1	30.22	30.93	31.33	27.63	27.60	27.57
1880.1	30.62	31.16	31.38	27.94	27.84	27.72
1940.1	31.12	31.35	31.27	28.09	27.82	27.57

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	50.19	50.91	51.34
50.1	80.1	37.41	37.55	37.67
90.1	120.1	32.66	33.15	32.95
130.1	160.1	30.42	30.66	30.83
170.1	200.1	28.71	28.92	29.22
210.1	240.1	27.61	27.99	28.22
250.1	280.1	27.15	27.43	27.77
310.1	340.1	27.07	27.69	28.04
350.1	380.1	26.94	27.77	28.40
410.1	440.1	27.87	28.67	29.51
450.1	480.1	28.54	29.22	29.81
510.1	540.1	29.70	31.64	33.51
550.1	580.1	27.92	28.97	29.91
610.1	640.1	23.96	24.10	24.22
650.1	680.1	21.77	21.76	21.68
710.1	740.1	19.85	19.74	19.59
750.1	780.1	19.12	18.96	18.84
810.1	840.1	18.42	18.34	18.33
850.1	880.1	18.46	18.47	18.56
910.1	940.1	18.70	18.79	19.00
950.1	980.1	18.69	18.57	18.63
1010.1	1040.1	18.79	18.32	17.95
1050.1	1080.1	18.80	18.40	17.94
1110.1	1140.1	17.82	17.64	17.25
1150.1	1180.1	16.72	16.58	16.23
1210.1	1240.1	14.81	14.63	14.33
1250.1	1280.1	13.63	13.37	13.04
1310.1	1340.1	11.96	11.54	11.12
1350.1	1380.1	11.01	10.54	10.04
1410.1	1440.1	9.85	9.26	8.73
1450.1	1480.1	9.13	8.51	7.92
1510.1	1540.1	7.98	7.25	6.68
1550.1	1580.1	7.29	6.54	6.02
1610.1	1640.1	6.17	5.53	5.12
1650.1	1680.1	5.66	5.09	4.73
1710.1	1740.1	5.06	4.58	4.29
1750.1	1780.1	4.82	4.35	4.08
1810.1	1840.1	4.56	4.18	3.96
1850.1	1880.1	4.62	4.22	4.04
1910.1	1940.1	4.76	4.42	4.26



Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1500MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
10.1	40.1	1.19	1.09	1.12	40.1	2.93	7.47	8.16	10.0	1.15	1.14	1.15
50.1	80.1	1.33	1.17	1.05	80.1	1.96	3.00	4.66	50.0	1.09	1.04	1.04
90.1	120.1	1.33	1.16	1.06	120.1	1.93	2.86	4.18	90.0	1.07	1.02	1.03
130.1	160.1	1.33	1.17	1.08	160.1	1.86	2.70	3.84	130.0	1.08	1.02	1.02
170.1	200.1	1.39	1.23	1.15	200.1	1.81	2.60	3.65	170.0	1.09	1.03	1.02
210.1	240.1	1.38	1.23	1.15	240.1	1.86	2.69	3.79	190.0	1.09	1.02	1.03
250.1	280.1	1.47	1.32	1.23	280.1	1.80	2.55	3.54	230.0	1.11	1.04	1.02
310.1	340.1	1.50	1.36	1.27	340.1	1.84	2.61	3.60	250.0	1.12	1.06	1.02
350.1	380.1	1.58	1.43	1.35	380.1	1.80	2.53	3.47	290.0	1.11	1.04	1.03
410.1	440.1	1.65	1.50	1.40	440.1	1.85	2.60	3.54	310.0	1.11	1.04	1.05
450.1	480.1	1.74	1.59	1.49	480.1	1.84	2.56	3.45	350.0	1.15	1.08	1.06
510.1	540.1	1.83	1.68	1.57	540.1	1.88	2.61	3.50	370.0	1.13	1.05	1.05
550.1	580.1	1.93	1.78	1.68	580.1	1.88	2.59	3.47	410.0	1.13	1.08	1.09
610.1	640.1	2.00	1.87	1.78	640.1	1.92	2.62	3.47	430.0	1.18	1.11	1.08
650.1	680.1	2.01	1.91	1.84	680.1	1.93	2.62	3.44	470.0	1.18	1.12	1.10
710.1	740.1	1.99	1.91	1.88	740.1	1.98	2.66	3.48	490.0	1.20	1.15	1.14
750.1	780.1	1.98	1.91	1.89	780.1	2.00	2.68	3.50	530.0	1.26	1.21	1.18
810.1	840.1	1.94	1.85	1.83	840.1	2.04	2.71	3.51	550.0	1.28	1.23	1.22
850.1	880.1	1.89	1.79	1.77	880.1	2.06	2.70	3.48	590.0	1.30	1.26	1.25
910.1	940.1	1.83	1.68	1.64	940.1	2.11	2.73	3.48	610.0	1.31	1.26	1.24
950.1	980.1	1.87	1.68	1.59	980.1	2.15	2.76	3.50	650.0	1.42	1.37	1.35
1010.1	1040.1	1.94	1.78	1.69	1040.1	2.21	2.82	3.54	670.0	1.44	1.38	1.36
1050.1	1080.1	1.91	1.76	1.69	1080.1	2.25	2.84	3.54	710.0	1.50	1.44	1.42
1110.1	1140.1	1.83	1.70	1.64	1140.1	2.28	2.87	3.56	730.0	1.62	1.57	1.55
1150.1	1180.1	1.81	1.68	1.60	1180.1	2.31	2.89	3.56	770.0	1.68	1.62	1.58
1210.1	1240.1	1.74	1.59	1.51	1240.1	2.34	2.91	3.58	790.0	1.69	1.63	1.60
1250.1	1280.1	1.72	1.54	1.44	1280.1	2.36	2.91	3.56	830.0	1.90	1.84	1.80
1310.1	1340.1	1.63	1.45	1.33	1340.1	2.38	2.91	3.56	850.0	1.93	1.86	1.81
1350.1	1380.1	1.62	1.43	1.29	1380.1	2.39	2.89	3.52	890.0	1.99	1.92	1.88
1410.1	1440.1	1.56	1.37	1.22	1440.1	2.42	2.91	3.53	910.0	2.13	2.07	2.02
1450.1	1480.1	1.54	1.34	1.19	1480.1	2.43	2.88	3.47	950.0	2.35	2.28	2.22
1510.1	1540.1	1.43	1.23	1.09	1540.1	2.43	2.86	3.45	970.0	2.39	2.33	2.28
1550.1	1580.1	1.40	1.23	1.15	1580.1	2.43	2.83	3.40	1010.0	2.57	2.52	2.48
1610.1	1640.1	1.33	1.24	1.23	1640.1	2.52	2.91	3.47	1030.0	2.68	2.63	2.59
1650.1	1680.1	1.40	1.34	1.34	1680.1	2.59	2.94	3.48	1070.0	2.80	2.75	2.72
1710.1	1740.1	1.48	1.46	1.48	1740.1	2.75	3.07	3.59	1090.0	2.80	2.75	2.72
1750.1	1780.1	1.62	1.61	1.63	1780.1	2.83	3.09	3.56	1130.0	3.07	3.03	3.01
1810.1	1840.1	1.76	1.76	1.77	1840.1	3.00	3.21	3.65	1150.0	3.22	3.17	3.15
1850.1	1880.1	1.89	1.88	1.89	1880.1	3.11	3.25	3.65	1190.0	3.17	3.11	3.09
1910.1	1940.1	2.01	1.99	1.99	1940.1	3.28	3.39	3.78	1210.0	3.26	3.22	3.20

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	21	17	31	15	28	31	52	45	46
1	-	12	+0	29	22	22	34	29	35	35	41	43
2	>90	61	50	67	49	61	54	53	47	58	54	65
3	>90	50	52	66	54	59	58	50	65	56	60	60
4	>90	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70
5	>90	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70
6	>90	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70
7	>90	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70
8	>90	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70
9	>90	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70
10	>90	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70	>70
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 750 MHz; -14.00 dBm.
 LO IN: 780 MHz; +7.00 dBm
 IF OUT: 30 MHz; -20.35 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	19	31	28	50	28	42	48	59	62	74
1	-	12	+0	30	20	27	36	36	43	47	58	63
2	70	67	51	64	52	61	52	55	44	56	56	76
3	>90	35	36	52	37	47	54	38	50	46	52	52
4	>90	62	68	72	61	74	61	68	63	65	56	68
5	>90	61	67	54	55	67	53	56	55	51	61	57
6	>90	75	78	76	74	76	68	>80	67	75	72	75
7	>90	79	78	71	77	65	67	71	64	64	66	62
8	>90	>80	>80	>80	>80	>80	>80	>80	75	>80	73	>80
9	>90	>80	>80	>80	>80	>80	>80	76	77	76	74	73
10	>90	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 750 MHz; -4.00 dBm.
 LO IN: 780 MHz; +7.00 dBm
 IF OUT: 30 MHz; -10.5 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.