

Frequency Mixer

ADE-ED13328/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=110.6MHz (dB)		
		@LO (dBm)		
		+10	+13	+16
130.0	240.6	7.97	7.14	6.93
170.0	280.6	7.63	7.16	7.01
210.0	320.6	7.39	7.06	6.93
250.0	360.6	7.35	7.06	6.92
290.0	400.6	7.39	7.12	6.98
330.0	440.6	7.25	7.00	6.86
380.0	490.6	7.28	7.04	6.90
420.0	530.6	7.21	6.95	6.80
470.0	580.6	7.25	6.97	6.81
510.0	620.6	7.27	6.94	6.75
560.0	670.6	7.37	7.06	6.83
600.0	710.6	7.28	7.00	6.79
650.0	760.6	7.25	6.97	6.78
690.0	800.6	7.13	6.87	6.71
740.0	850.6	7.10	6.85	6.70
780.0	890.6	7.11	6.81	6.68
830.0	940.6	7.24	6.85	6.68
870.0	980.6	7.39	6.93	6.71
920.0	1030.6	7.58	7.09	6.80
960.0	1070.6	7.66	7.15	6.83
1010.0	1120.6	7.88	7.37	6.97
1050.0	1160.6	7.89	7.35	6.95
1100.0	1210.6	8.04	7.48	7.01
1140.0	1250.6	8.06	7.46	7.00
1190.0	1300.6	8.07	7.45	7.02
1230.0	1340.6	8.14	7.52	7.11
1280.0	1390.6	8.17	7.64	7.28
1320.0	1430.6	8.42	7.95	7.61
1370.0	1480.6	8.51	8.18	7.94
1410.0	1520.6	8.83	8.54	8.37
1460.0	1570.6	8.85	8.58	8.45
1500.0	1610.6	9.20	8.90	8.76
1550.0	1660.6	9.28	9.03	8.84
1590.0	1700.6	9.63	9.42	9.25
1640.0	1750.6	9.74	9.53	9.37
1680.0	1790.6	10.21	9.98	9.83
1730.0	1840.6	10.40	10.15	10.01

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+10	+13	+16
130.0	240.6	16.26	20.63	24.29
170.0	280.6	18.78	22.30	26.29
210.0	320.6	19.61	23.49	26.64
250.0	360.6	20.34	23.40	27.41
290.0	400.6	20.68	24.18	27.91
330.0	440.6	20.98	25.20	27.94
380.0	490.6	21.60	24.04	27.77
420.0	530.6	24.35	27.30	29.08
470.0	580.6	22.82	26.09	24.98
510.0	620.6	21.45	26.26	25.52
560.0	670.6	21.44	23.70	26.96
600.0	710.6	23.02	24.90	26.30
650.0	760.6	22.43	23.71	24.39
690.0	800.6	24.04	24.46	24.15
740.0	850.6	26.38	23.07	22.80
780.0	890.6	25.14	24.28	22.42
830.0	940.6	20.44	26.97	24.06
870.0	980.6	17.75	28.40	24.67
920.0	1030.6	16.26	20.61	25.57
960.0	1070.6	16.02	20.08	24.66
1010.0	1120.6	15.53	18.37	23.20
1050.0	1160.6	17.24	20.22	22.86
1100.0	1210.6	17.00	18.85	20.81
1140.0	1250.6	16.39	17.90	19.23
1190.0	1300.6	16.13	17.50	18.17
1230.0	1340.6	15.84	16.95	17.64
1280.0	1390.6	16.42	17.02	17.67
1320.0	1430.6	16.52	17.04	17.78
1370.0	1480.6	17.95	18.64	19.14
1410.0	1520.6	18.91	19.69	20.21
1460.0	1570.6	19.70	20.72	21.55
1500.0	1610.6	20.44	21.48	21.98
1550.0	1660.6	21.30	22.18	22.77
1590.0	1700.6	21.75	23.03	23.36
1640.0	1750.6	22.28	23.57	23.67
1680.0	1790.6	22.58	24.14	24.30
1730.0	1840.6	24.35	24.83	25.17

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+8dBm (dB)		
		@LO (dBm)		
		+10	+13	+16
130.0	240.6	0.04	0.12	0.07
170.0	280.6	0.24	0.12	0.05
210.0	320.6	0.24	0.13	0.08
250.0	360.6	0.24	0.12	0.07
290.0	400.6	0.19	0.10	0.08
330.0	440.6	0.21	0.12	0.10
380.0	490.6	0.23	0.15	0.13
420.0	530.6	0.24	0.16	0.14
470.0	580.6	0.25	0.18	0.15
510.0	620.6	0.23	0.20	0.17
560.0	670.6	0.22	0.18	0.17
600.0	710.6	0.31	0.23	0.21
650.0	760.6	0.42	0.31	0.26
690.0	800.6	0.55	0.40	0.32
740.0	850.6	0.68	0.45	0.33
780.0	890.6	0.76	0.53	0.40
830.0	940.6	0.77	0.60	0.46
870.0	980.6	0.79	0.65	0.51
920.0	1030.6	0.80	0.68	0.56
960.0	1070.6	0.85	0.77	0.64
1010.0	1120.6	0.91	0.81	0.71
1050.0	1160.6	0.99	0.89	0.78
1100.0	1210.6	1.04	0.93	0.87
1140.0	1250.6	1.10	1.01	0.94
1190.0	1300.6	1.23	1.18	1.06
1230.0	1340.6	1.25	1.19	1.10
1280.0	1390.6	1.29	1.21	1.16
1320.0	1430.6	1.13	1.06	1.04
1370.0	1480.6	1.03	0.91	0.86
1410.0	1520.6	0.82	0.68	0.60
1460.0	1570.6	0.76	0.60	0.49
1500.0	1610.6	0.60	0.48	0.39
1550.0	1660.6	0.57	0.41	0.37
1590.0	1700.6	0.50	0.33	0.28
1640.0	1750.6	0.49	0.33	0.28
1680.0	1790.6	0.44	0.29	0.24
1730.0	1840.6	0.38	0.26	0.21

REV. X2

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=711MHz (dB)
		@LO (dBm)
		+13
600.9	110.1	11.00
570.2	140.8	7.51
539.5	171.5	7.11
508.8	202.2	6.64
478.1	232.9	6.58
447.4	263.6	6.58
416.7	294.3	6.61
386.0	325.0	6.60
355.3	355.7	6.11
324.6	386.4	6.58
293.9	417.1	6.59
263.2	447.8	6.66
232.5	478.5	6.61
201.9	509.1	6.70
171.2	539.8	6.64
140.5	570.5	6.70
109.8	601.2	6.75
79.1	631.9	6.77
48.4	662.6	6.81
17.7	693.3	6.99
75.2	786.2	6.88
205.5	916.5	6.85
335.9	1046.9	7.03
466.2	1177.2	7.08
596.5	1307.5	6.96
726.9	1437.9	6.67
857.2	1568.2	6.52
987.6	1698.6	6.49
1117.9	1828.9	6.70
1248.3	1959.3	6.87
1378.6	2089.6	6.97
1508.9	2219.9	7.19
1639.3	2350.3	7.51
1769.6	2480.6	8.24
1900.0	2611.0	8.73
2030.3	2741.3	8.87
2160.7	2871.7	8.83
2291.0	3002.0	9.10
2421.3	3132.3	9.98
2519.1	3230.1	10.82

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=470MHz (dB)
		@LO (dBm)
		+13
10.1	480.1	7.34
70.1	540.1	6.95
130.1	600.1	7.01
190.1	660.1	7.16
250.1	720.1	7.28
310.1	780.1	7.23
370.1	840.1	7.22
430.1	900.1	7.23
490.1	960.1	7.23
550.1	1020.1	7.15
610.1	1080.1	7.15
670.1	1140.1	7.22
730.1	1200.1	7.34
790.1	1260.1	7.24
850.1	1320.1	7.05
910.1	1380.1	6.96
970.1	1440.1	6.95
1030.1	1500.1	6.86
1090.1	1560.1	6.84
1150.1	1620.1	6.86
1210.1	1680.1	6.89
1270.1	1740.1	6.88
1330.1	1800.1	6.95
1390.1	1860.1	6.96
1470.1	1940.1	7.08
1530.1	2000.1	7.29
1610.1	2080.1	7.58
1670.1	2140.1	7.80
1750.1	2220.1	8.14
1810.1	2280.1	8.47
1890.1	2360.1	8.96
1950.1	2420.1	9.18
2030.1	2500.1	9.50
2090.1	2560.1	9.59
2170.1	2640.1	9.45
2230.1	2700.1	9.53
2310.1	2780.1	9.82
2370.1	2840.1	9.97
2450.1	2920.1	10.42
2510.1	2980.1	10.78

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=952MHz (dB)
		@LO (dBm)
		+13
850.0	102.0	13.14
830.0	122.0	8.60
810.0	142.0	7.69
790.0	162.0	7.55
770.0	182.0	7.21
750.0	202.0	6.89
730.0	222.0	6.86
710.0	242.0	6.86
690.0	262.0	6.82
670.0	282.0	6.80
650.0	302.0	6.78
630.0	322.0	6.79
610.0	342.0	6.80
590.0	362.0	6.81
570.0	382.0	6.81
550.0	402.0	6.79
530.0	422.0	6.80
510.0	442.0	6.80
490.0	462.0	6.83
470.0	482.0	6.74
450.0	502.0	6.74
430.0	522.0	6.80
410.0	542.0	6.75
390.0	562.0	6.75
370.0	582.0	6.76
350.0	602.0	6.77
330.0	622.0	6.82
310.0	642.0	6.77
290.0	662.0	6.79
260.0	692.0	6.79
240.0	712.0	6.83
210.0	742.0	6.80
190.0	762.0	6.79
160.0	792.0	6.77
140.0	812.0	6.78
110.0	842.0	6.74
90.0	862.0	6.80
60.0	892.0	6.82
40.0	912.0	6.84
10.0	942.0	7.26

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
240.6	49.57	52.30	55.48	50.45	49.49	46.58
280.6	48.02	51.01	54.21	52.15	52.59	46.99
320.6	47.53	50.69	54.27	58.90	52.41	45.81
360.6	46.17	49.42	52.92	55.99	52.94	45.55
400.6	45.77	48.71	52.04	52.44	50.01	44.65
440.6	44.63	48.14	51.75	47.08	47.94	43.50
490.6	43.75	46.83	50.57	42.61	43.74	42.60
530.6	42.95	45.92	49.39	40.84	41.27	40.24
580.6	42.62	46.30	50.21	38.82	40.23	39.22
620.6	41.67	45.74	50.54	37.28	39.26	39.10
670.6	41.02	44.06	47.69	35.74	37.51	38.54
710.6	40.59	43.73	47.32	34.61	35.76	36.50
760.6	40.17	43.33	47.02	34.01	34.81	34.60
800.6	40.57	44.24	47.90	33.53	34.55	34.23
850.6	41.20	45.63	48.75	32.52	34.13	34.02
890.6	39.21	43.64	47.12	31.49	33.79	34.15
940.6	37.05	40.47	43.96	30.20	32.86	34.32
980.6	36.12	39.06	42.27	29.05	31.73	33.73
1030.6	34.94	37.52	40.22	28.15	30.72	33.21
1070.6	34.24	36.80	39.42	27.37	29.60	31.96
1120.6	33.10	35.46	37.87	26.83	28.69	30.90
1160.6	32.72	35.26	37.85	26.34	27.93	29.68
1210.6	32.05	34.65	37.16	26.39	27.95	29.36
1250.6	31.98	34.93	37.68	26.19	27.77	29.04
1300.6	31.92	35.09	37.76	26.21	27.80	29.00
1340.6	32.25	35.43	37.75	26.14	27.77	29.02
1390.6	32.34	34.89	36.64	26.02	27.74	29.12
1430.6	32.20	34.37	35.79	26.08	28.07	29.66
1480.6	31.72	33.50	34.73	25.87	28.12	30.00
1520.6	31.03	32.89	34.07	25.90	28.51	30.82
1570.6	30.20	32.34	33.81	25.43	28.37	31.31
1610.6	29.48	31.73	33.32	25.20	28.30	31.55
1660.6	29.00	31.29	33.04	24.99	28.18	31.71
1700.6	28.40	30.71	32.46	24.66	27.91	31.47
1750.6	28.54	30.78	32.47	25.30	28.62	32.24
1790.6	28.15	30.39	32.07	25.23	28.59	32.26
1840.6	28.55	30.68	32.26	26.43	29.90	33.67

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
130.0	240.6	33.10	33.16	33.19
170.0	280.6	31.02	31.16	31.21
210.0	320.6	29.50	29.54	29.66
250.0	360.6	28.35	28.44	28.40
290.0	400.6	27.42	27.45	27.54
330.0	440.6	26.63	26.82	26.88
380.0	490.6	25.83	25.99	26.18
420.0	530.6	25.45	25.49	25.58
470.0	580.6	25.21	25.38	25.46
510.0	620.6	24.91	25.12	25.26
560.0	670.6	24.77	24.95	25.24
600.0	710.6	24.63	24.85	25.11
650.0	760.6	23.95	24.24	24.39
690.0	800.6	23.34	23.59	23.71
740.0	850.6	22.18	22.32	22.46
780.0	890.6	21.69	21.80	21.88
830.0	940.6	21.13	21.42	21.59
870.0	980.6	20.63	20.99	21.27
920.0	1030.6	20.15	20.37	20.81
960.0	1070.6	19.95	20.07	20.42
1010.0	1120.6	19.95	19.88	19.99
1050.0	1160.6	20.39	20.36	20.34
1100.0	1210.6	20.82	20.92	20.85
1140.0	1250.6	21.24	21.38	21.37
1190.0	1300.6	21.59	21.77	21.77
1230.0	1340.6	21.67	21.99	22.10
1280.0	1390.6	21.51	21.98	22.21
1320.0	1430.6	21.03	21.51	21.75
1370.0	1480.6	20.15	20.46	20.61
1410.0	1520.6	19.11	19.28	19.33
1460.0	1570.6	17.75	17.79	17.72
1500.0	1610.6	16.75	16.64	16.54
1550.0	1660.6	15.49	15.28	15.12
1590.0	1700.6	14.58	14.29	14.08
1640.0	1750.6	13.51	13.14	12.90
1680.0	1790.6	12.82	12.38	12.11
1730.0	1840.6	11.95	11.43	11.15

Frequency Mixer

ADE-ED13328/1

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1062.6MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
130.0	240.6	1.12	1.27	1.35	240.6	6.42	4.36	4.68	100.0	2.09	1.73	1.48
170.0	280.6	1.19	1.30	1.36	280.6	4.39	3.54	4.10	130.0	2.15	1.78	1.53
210.0	320.6	1.22	1.31	1.37	320.6	3.22	3.23	4.10	160.0	2.05	1.70	1.45
250.0	360.6	1.23	1.31	1.37	360.6	2.62	2.89	3.82	190.0	2.10	1.75	1.51
290.0	400.6	1.24	1.31	1.36	400.6	2.34	2.82	3.80	220.0	2.15	1.80	1.56
330.0	440.6	1.25	1.32	1.38	440.6	2.10	2.73	3.79	250.0	2.05	1.72	1.49
380.0	490.6	1.26	1.32	1.37	490.6	1.92	2.63	3.69	280.0	2.08	1.75	1.53
420.0	530.6	1.28	1.34	1.40	530.6	1.87	2.66	3.77	310.0	2.12	1.80	1.58
470.0	580.6	1.29	1.36	1.42	580.6	1.79	2.60	3.69	340.0	2.07	1.75	1.54
510.0	620.6	1.30	1.37	1.42	620.6	1.79	2.66	3.78	370.0	2.04	1.74	1.54
560.0	670.6	1.33	1.38	1.44	670.6	1.77	2.62	3.69	400.0	2.10	1.80	1.61
600.0	710.6	1.36	1.41	1.46	710.6	1.81	2.69	3.81	420.0	2.03	1.73	1.55
650.0	760.6	1.41	1.47	1.52	760.6	1.80	2.66	3.75	450.0	2.03	1.75	1.59
690.0	800.6	1.45	1.51	1.56	800.6	1.84	2.72	3.85	470.0	2.06	1.77	1.59
740.0	850.6	1.48	1.56	1.62	850.6	1.88	2.73	3.83	500.0	2.01	1.74	1.59
780.0	890.6	1.49	1.56	1.62	890.6	1.96	2.81	3.91	520.0	2.07	1.79	1.63
830.0	940.6	1.53	1.59	1.65	940.6	2.02	2.86	3.95	550.0	1.99	1.73	1.58
870.0	980.6	1.57	1.62	1.67	980.6	2.10	2.95	4.02	570.0	2.08	1.81	1.66
920.0	1030.6	1.62	1.65	1.70	1030.6	2.14	2.99	4.08	600.0	2.03	1.77	1.63
960.0	1070.6	1.69	1.71	1.75	1070.6	2.20	3.03	4.10	620.0	2.03	1.78	1.66
1010.0	1120.6	1.79	1.79	1.81	1120.6	2.24	3.06	4.13	650.0	2.04	1.78	1.64
1050.0	1160.6	1.90	1.90	1.91	1160.6	2.24	3.05	4.12	670.0	2.02	1.78	1.66
1100.0	1210.6	2.09	2.07	2.06	1210.6	2.26	3.04	4.09	700.0	2.03	1.79	1.67
1140.0	1250.6	2.27	2.25	2.23	1250.6	2.27	3.04	4.11	720.0	1.97	1.73	1.62
1190.0	1300.6	2.55	2.50	2.46	1300.6	2.24	2.96	3.98	750.0	2.02	1.79	1.68
1230.0	1340.6	2.78	2.72	2.67	1340.6	2.26	3.00	4.04	770.0	1.99	1.75	1.64
1280.0	1390.6	3.07	3.00	2.93	1390.6	2.32	3.00	3.99	800.0	1.98	1.75	1.66
1320.0	1430.6	3.31	3.24	3.17	1430.6	2.40	3.08	4.10	820.0	1.99	1.75	1.63
1370.0	1480.6	3.65	3.59	3.53	1480.6	2.55	3.14	4.09	850.0	1.96	1.73	1.63
1410.0	1520.6	3.88	3.82	3.78	1520.6	2.69	3.25	4.20	870.0	2.01	1.78	1.67
1460.0	1570.6	4.16	4.10	4.06	1570.6	2.83	3.29	4.15	900.0	1.96	1.73	1.62
1500.0	1610.6	4.31	4.23	4.18	1610.6	3.01	3.40	4.24	920.0	2.00	1.77	1.67
1550.0	1660.6	4.43	4.37	4.30	1660.6	3.20	3.52	4.31	950.0	1.96	1.74	1.62
1590.0	1700.6	4.60	4.52	4.44	1700.6	3.42	3.61	4.38	970.0	1.99	1.77	1.66
1640.0	1750.6	4.69	4.61	4.54	1750.6	3.66	3.77	4.47	1000.0	1.99	1.77	1.65
1680.0	1790.6	4.80	4.68	4.59	1790.6	3.88	3.81	4.43	1020.0	1.94	1.73	1.63
1730.0	1840.6	4.86	4.72	4.63	1840.6	4.12	3.99	4.57	1050.0	2.03	1.82	1.71

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	9	19	13	23	18	31	32	43	42	52
1	-	17	+0	41	11	33	34	37	42	51	51	73
2	74	74	53	63	50	65	57	80	64	65	71	75
3	>100	>86	70	78	83	73	72	>86	76	77	80	>86
4	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
5	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
6	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
7	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
8	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
9	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
10	>100	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86	>86
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 711 MHz; -7.00 dBm.
LO IN: 821.6 MHz; +13.00 dBm
IF OUT: 110.6 MHz; -13.95 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	18	29	24	33	30	43	45	58	64	74
1	-	17	+0	43	11	33	35	40	46	56	57	80
2	54	59	43	57	40	58	49	75	54	59	62	69
3	87	61	49	60	61	53	47	62	56	56	61	69
4	>100	76	74	69	73	73	71	76	70	82	76	79
5	>100	73	73	72	71	74	67	69	64	74	77	87
6	>100	>96	95	91	89	>96	83	92	77	85	86	>96
7	>100	95	>96	>96	92	>96	87	91	84	91	89	94
8	>100	>96	>96	>96	>96	>96	>96	>96	>96	>96	>96	>96
9	>100	>96	>96	>96	>96	>96	>96	>96	>96	>96	>96	>96
10	>100	>96	>96	>96	>96	>96	>96	>96	>96	>96	>96	>96
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 711 MHz; 3.00 dBm.
LO IN: 821.6 MHz; +13.00 dBm
IF OUT: 110.6 MHz; -3.95 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.