

Frequency Mixer

ADE-2ASK+

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
1.0	31.0	6.33	6.13	5.83	10.1	40.1	20.63	23.58	22.71	10.1	40.1	1.31	1.20	0.88
2.0	32.0	5.98	5.68	5.58	50.4	80.4	23.45	19.76	23.68	50.4	80.4	1.41	1.10	0.96
2.2	32.2	5.88	5.68	5.48	90.8	120.8	20.06	20.85	22.02	90.8	120.8	1.46	1.16	0.98
4.7	34.7	5.75	5.45	5.35	110.9	140.9	19.20	19.79	20.11	110.9	140.9	1.49	1.23	0.99
10.3	40.3	5.60	5.40	5.30	151.3	181.3	18.73	24.20	19.96	151.3	181.3	1.46	1.06	0.95
50.4	80.4	5.62	5.34	5.20	171.5	201.5	18.48	23.33	21.14	171.5	201.5	1.40	1.08	0.86
90.8	120.8	5.64	5.39	5.25	211.8	241.8	22.35	18.50	20.44	211.8	241.8	1.32	1.00	0.85
110.9	140.9	5.63	5.38	5.25	232.0	262.0	19.40	21.64	20.99	232.0	262.0	1.37	1.14	0.88
171.5	201.5	5.65	5.43	5.30	272.3	302.3	19.97	16.95	23.32	272.3	302.3	1.31	1.00	0.91
211.8	241.8	5.68	5.46	5.32	292.5	322.5	15.84	13.51	14.13	292.5	322.5	1.26	1.04	0.87
232.0	262.0	5.69	5.48	5.33	332.8	362.8	16.12	14.50	15.45	332.8	362.8	1.33	1.09	0.90
272.3	302.3	5.74	5.52	5.37	353.0	383.0	18.85	20.31	20.72	353.0	383.0	1.34	1.17	0.90
292.5	322.5	5.73	5.51	5.37	393.3	423.3	14.51	15.27	21.80	393.3	423.3	1.28	1.01	0.93
332.8	362.8	5.76	5.52	5.36	413.5	443.5	13.55	13.99	15.06	413.5	443.5	1.35	1.13	0.94
353.0	383.0	5.82	5.55	5.37	453.8	483.8	14.56	13.02	14.20	453.8	483.8	1.44	1.11	0.94
393.3	423.3	5.91	5.65	5.45	474.0	504.0	14.90	13.22	13.67	474.0	504.0	1.52	1.29	1.02
453.8	483.8	5.99	5.75	5.58	514.3	544.3	16.29	15.05	18.07	514.3	544.3	1.66	1.24	0.99
474.0	504.0	5.98	5.73	5.56	534.5	564.5	14.60	15.28	20.73	534.5	564.5	1.74	1.30	1.06
514.3	544.3	5.98	5.70	5.54	574.8	604.8	9.70	15.13	16.99	574.8	604.8	1.92	1.54	1.30
534.5	564.5	6.05	5.73	5.58	595.0	625.0	7.27	12.16	16.38	595.0	625.0	1.92	1.61	1.42
574.8	604.8	6.29	5.86	5.65	635.4	665.4	4.82	6.84	11.93	635.4	665.4	2.03	1.89	1.71
595.0	625.0	6.47	6.01	5.73	655.5	685.5	4.33	5.91	9.59	655.5	685.5	2.02	1.82	1.69
635.4	665.4	6.78	6.32	5.91	695.9	725.9	4.31	5.21	6.96	695.9	725.9	2.00	1.82	1.68
695.9	725.9	7.12	6.68	6.26	716.0	746.0	4.42	5.26	6.64	716.0	746.0	2.10	1.78	1.73
716.0	746.0	7.22	6.78	6.38	756.4	786.4	4.89	5.85	7.41	756.4	786.4	1.96	1.84	1.67
756.4	786.4	7.42	6.95	6.52	776.5	806.5	5.47	6.54	8.25	776.5	806.5	2.01	1.86	1.75
776.5	806.5	7.54	7.02	6.57	816.9	846.9	7.42	8.71	10.77	816.9	846.9	2.23	2.09	1.90
816.9	846.9	7.56	6.96	6.51	837.0	867.0	8.91	9.93	14.36	837.0	867.0	2.08	1.85	1.73
837.0	867.0	7.55	6.92	6.48	877.4	907.4	12.31	15.89	17.50	877.4	907.4	2.23	1.83	1.70
877.4	907.4	7.49	6.86	6.46	897.6	927.6	16.12	19.42	15.50	897.6	927.6	2.20	1.93	1.70
897.6	927.6	7.43	6.84	6.47	937.9	967.9	15.21	15.68	14.49	937.9	967.9	2.29	1.92	1.67
958.1	988.1	7.56	7.04	6.76	958.1	988.1	14.33	14.11	14.23	958.1	988.1	2.12	1.84	1.56
998.4	1028.4	7.71	7.28	7.04	998.4	1028.4	12.27	13.56	14.66	998.4	1028.4	2.17	1.67	1.42
1018.6	1048.6	7.86	7.42	7.20	1018.6	1048.6	11.30	13.39	14.24	1018.6	1048.6	2.15	1.68	1.53
1058.9	1088.9	8.22	7.82	7.60	1058.9	1088.9	10.85	11.89	11.33	1058.9	1088.9	1.97	1.59	1.32
1079.1	1109.1	8.42	8.04	7.86	1079.1	1109.1	10.91	11.13	10.80	1079.1	1109.1	1.92	1.50	1.28
1119.4	1149.4	8.86	8.50	8.35	1119.4	1149.4	9.50	9.94	9.46	1119.4	1149.4	1.92	1.35	1.15
1139.6	1169.6	9.17	8.79	8.64	1139.6	1169.6	9.43	10.13	9.68	1139.6	1169.6	1.93	1.32	1.02
1179.9	1209.9	9.68	9.29	9.17	1179.9	1209.9	8.84	10.59	10.73	1179.9	1209.9	1.88	1.29	1.00
1200.1	1230.1	9.90	9.53	9.40	1200.1	1230.1	9.14	10.96	11.92	1200.1	1230.1	1.88	1.23	0.85



Frequency Mixer

ADE-2ASK+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (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)=1000.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
490.0	10.1	5.82	10.0	20.1	5.10	990.0	10.1	8.14
477.7	22.4	5.80	30.0	40.1	4.68	970.0	30.1	8.16
465.4	34.7	5.77	50.0	60.1	4.83	950.0	50.1	8.15
453.1	47.0	5.75	70.0	80.1	4.80	930.0	70.1	8.16
440.8	59.3	5.77	90.0	100.1	4.74	910.0	90.1	8.18
428.5	71.6	5.76	110.0	120.1	4.75	890.0	110.1	8.15
416.2	83.9	5.72	130.0	140.1	4.80	870.0	130.1	8.09
403.8	96.3	5.65	150.0	160.1	4.79	850.0	150.1	8.12
391.5	108.6	5.65	170.0	180.1	4.80	830.0	170.1	8.14
379.2	120.9	5.65	190.0	200.1	4.82	810.0	190.1	8.09
366.9	133.2	5.65	210.0	220.1	4.85	790.0	210.1	8.08
354.6	145.5	5.65	230.0	240.1	4.87	770.0	230.1	8.01
342.3	157.8	5.65	250.0	260.1	4.91	750.0	250.1	7.96
330.0	170.1	5.65	270.0	280.1	4.95	730.0	270.1	7.96
317.7	182.4	5.66	290.0	300.1	4.99	710.0	290.1	7.93
305.4	194.7	5.67	310.0	320.1	4.99	690.0	310.1	7.90
293.1	207.0	5.66	330.0	340.1	4.94	670.0	330.1	7.85
280.8	219.3	5.65	350.0	360.1	4.92	650.0	350.1	7.79
268.5	231.6	5.65	370.0	380.1	4.96	630.0	370.1	7.71
256.2	243.9	5.68	390.0	400.1	5.00	610.0	390.1	7.71
243.8	256.3	5.65	430.0	440.1	5.55	570.0	430.1	7.78
231.5	268.6	5.60	450.0	460.1	5.20	550.0	450.1	7.84
219.2	280.9	5.60	490.0	500.1	5.23	510.0	490.1	7.75
206.9	293.2	5.67	510.0	520.1	5.17	490.0	510.1	7.62
194.6	305.5	5.69	550.0	560.1	5.19	450.0	550.1	7.35
182.3	317.8	5.70	570.0	580.1	5.19	430.0	570.1	7.42
170.0	330.1	5.71	610.0	620.1	5.26	390.0	610.1	7.38
157.7	342.4	5.70	630.0	640.1	5.22	370.0	630.1	7.56
145.4	354.7	5.73	670.0	680.1	5.34	330.0	670.1	7.96
133.1	367.0	5.71	690.0	700.1	5.33	310.0	690.1	8.05
120.8	379.3	5.71	730.0	740.1	5.38	270.0	730.1	8.16
108.5	391.6	5.73	750.0	760.1	5.35	250.0	750.1	8.25
96.2	403.9	5.73	790.0	800.1	5.36	210.0	790.1	8.27
83.8	416.3	5.72	810.0	820.1	5.31	190.0	810.1	8.25
71.5	428.6	5.79	850.0	860.1	5.27	150.0	850.1	8.11
59.2	440.9	5.79	870.0	880.1	5.24	130.0	870.1	7.95
46.9	453.2	5.76	910.0	920.1	5.24	90.0	910.1	7.65
34.6	465.5	5.79	930.0	940.1	5.25	70.0	930.1	7.55
22.3	477.8	5.84	970.0	980.1	5.34	30.0	970.1	7.38
10.0	490.1	5.83	990.0	1000.1	5.39	10.0	990.1	7.51

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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
1.0	65.7	67.7	70.6	65.5	64.1	62.9
2.0	65.4	67.9	70.3	65.4	64.2	62.6
2.2	64.8	67.9	69.5	65.7	64.0	62.5
4.7	64.5	66.9	69.6	65.0	64.1	62.5
10.3	63.4	66.0	68.1	65.0	63.1	60.8
50.4	72.24	89.61	78.67	53.31	51.24	50.16
90.8	62.11	70.02	81.00	49.15	46.64	45.76
110.9	60.21	66.69	76.09	47.36	45.12	44.04
171.5	54.45	59.29	63.81	44.02	42.13	40.84
211.8	51.60	55.40	58.59	42.78	40.80	39.42
232.0	50.52	53.86	56.32	41.85	39.91	38.49
272.3	48.72	51.44	53.26	40.56	38.52	37.09
292.5	47.40	50.16	51.90	40.35	38.24	36.71
332.8	45.22	47.53	49.18	38.99	36.94	35.45
353.0	44.20	46.22	47.75	38.24	36.27	34.78
393.3	43.01	44.51	45.53	36.79	35.19	33.83
453.8	41.81	42.83	43.16	34.05	32.74	31.69
474.0	41.30	42.21	42.53	33.51	32.19	31.15
514.3	40.60	41.20	41.02	32.27	30.91	29.70
534.5	40.15	40.64	40.34	31.68	30.21	28.92
574.8	39.12	39.51	39.17	30.56	29.12	27.85
595.0	38.67	38.90	38.46	29.85	28.41	27.19
635.4	37.90	38.16	37.75	28.57	27.28	25.99
695.9	36.42	37.15	36.94	26.97	26.24	25.12
716.0	35.58	36.40	36.31	26.38	25.75	24.78
756.4	34.71	35.59	35.53	25.50	25.06	24.29
776.5	34.16	35.02	34.90	25.04	24.58	23.77
816.9	33.15	33.90	33.57	24.16	23.83	22.91
837.0	32.70	33.33	32.92	23.74	23.43	22.38
877.4	31.86	32.18	31.60	23.21	22.91	21.61
897.6	31.32	31.53	30.92	22.66	22.42	21.11
958.1	30.21	29.99	29.43	21.24	20.83	19.68
998.4	29.08	28.68	28.09	19.98	19.75	18.83
1018.6	28.55	28.03	27.41	19.25	19.11	18.28
1058.9	27.37	26.67	25.97	18.23	18.41	17.75
1079.1	26.84	26.03	25.24	17.51	17.97	17.48
1119.4	25.75	24.75	23.87	16.52	17.22	16.97
1139.6	25.29	24.16	23.24	16.14	16.92	16.73
1179.9	24.58	23.26	22.22	15.25	16.25	16.36
1200.1	24.03	22.67	21.63	14.89	15.93	16.09

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	34.31	34.06	35.99
50.4	80.4	33.92	34.31	35.56
90.8	120.8	30.41	30.78	30.39
110.9	140.9	29.26	29.40	29.34
151.3	181.3	27.42	27.61	27.58
171.5	201.5	26.58	26.81	26.94
211.8	241.8	25.80	25.97	26.25
232.0	262.0	25.61	25.84	26.07
272.3	302.3	25.36	25.86	26.30
292.5	322.5	25.36	25.89	26.22
332.8	362.8	25.62	26.11	26.51
353.0	383.0	25.92	26.46	26.93
393.3	423.3	26.71	27.30	27.85
413.5	443.5	26.95	27.52	28.08
453.8	483.8	26.36	27.04	27.52
474.0	504.0	25.52	25.95	26.33
514.3	544.3	23.26	23.53	23.67
534.5	564.5	22.13	22.12	22.15
574.8	604.8	20.41	20.15	19.92
595.0	625.0	19.81	19.50	19.21
635.4	665.4	18.94	18.72	18.46
655.5	685.5	18.65	18.46	18.33
695.9	725.9	18.47	18.25	18.23
716.0	746.0	18.54	18.31	18.26
756.4	786.4	18.90	18.72	18.68
776.5	806.5	19.00	18.84	18.81
816.9	846.9	18.92	18.64	18.45
837.0	867.0	18.60	18.22	17.90
877.4	907.4	17.76	17.26	16.99
897.6	927.6	17.28	16.93	16.71
937.9	967.9	16.44	16.28	16.15
958.1	988.1	15.94	15.83	15.68
998.4	1028.4	14.80	14.67	14.47
1018.6	1048.6	14.15	14.01	13.79
1058.9	1088.9	12.81	12.63	12.37
1079.1	1109.1	12.09	11.86	11.59
1119.4	1149.4	10.79	10.43	10.10
1139.6	1169.6	10.25	9.80	9.43
1179.9	1209.9	9.24	8.65	8.20
1200.1	1230.1	8.78	8.16	7.69



Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)		
		@LO (dBm)		
		+4	+7	+10
1.0	31.0	1.39	1.38	1.38
2.0	32.0	1.25	1.22	1.22
2.2	32.2	1.24	1.21	1.20
4.7	34.7	1.18	1.12	1.10
10.3	40.3	1.16	1.09	1.05
50.4	80.4	1.06	1.03	1.07
90.8	120.8	1.17	1.10	1.08
110.9	140.9	1.11	1.04	1.03
171.5	201.5	1.13	1.08	1.07
211.8	241.8	1.09	1.09	1.12
232.0	262.0	1.13	1.13	1.14
272.3	302.3	1.14	1.12	1.14
292.5	322.5	1.12	1.12	1.14
332.8	362.8	1.16	1.16	1.18
353.0	383.0	1.16	1.15	1.18
393.3	423.3	1.20	1.20	1.23
453.8	483.8	1.21	1.23	1.25
474.0	504.0	1.23	1.25	1.29
514.3	544.3	1.21	1.25	1.29
534.5	564.5	1.22	1.26	1.30
574.8	604.8	1.23	1.24	1.27
595.0	625.0	1.23	1.21	1.24
635.4	665.4	1.30	1.26	1.26
695.9	725.9	1.45	1.39	1.36
716.0	746.0	1.53	1.48	1.44
756.4	786.4	1.76	1.69	1.64
776.5	806.5	1.82	1.75	1.70
816.9	846.9	2.07	1.98	1.92
837.0	867.0	2.18	2.09	2.02
877.4	907.4	2.30	2.20	2.14
897.6	927.6	2.44	2.35	2.28
958.1	988.1	2.63	2.54	2.47
998.4	1028.4	2.88	2.79	2.72
1018.6	1048.6	2.93	2.83	2.75
1058.9	1088.9	2.97	2.88	2.82
1079.1	1109.1	3.07	2.98	2.90
1119.4	1149.4	2.99	2.89	2.82
1139.6	1169.6	3.01	2.91	2.84
1179.9	1209.9	3.07	2.93	2.84
1200.1	1230.1	2.96	2.82	2.73

LO (MHz)	LO VSWR (:1)		
	@LO (dBm)		
	+4	+7	+10
1.0	1.77	2.58	3.57
2.0	1.73	2.55	3.57
2.2	1.75	2.52	3.50
4.7	1.73	2.55	3.57
10.3	1.77	2.52	3.50
50.4	1.80	2.62	3.70
90.8	1.79	2.59	3.61
110.9	1.74	2.51	3.47
171.5	1.82	2.61	3.60
211.8	1.82	2.58	3.53
232.0	1.87	2.66	3.64
272.3	1.91	2.69	3.65
292.5	1.90	2.65	3.56
332.8	1.96	2.73	3.67
353.0	2.01	2.79	3.73
393.3	2.02	2.75	3.63
453.8	2.17	2.93	3.88
474.0	2.16	2.89	3.79
514.3	2.20	2.91	3.79
534.5	2.23	2.92	3.79
574.8	2.32	2.98	3.80
595.0	2.42	3.11	3.95
635.4	2.53	3.27	4.10
695.9	2.60	3.34	4.18
716.0	2.60	3.33	4.16
756.4	2.65	3.34	4.15
776.5	2.69	3.38	4.20
816.9	2.75	3.43	4.22
837.0	2.77	3.42	4.19
877.4	2.77	3.37	4.09
897.6	2.77	3.34	4.06
958.1	2.89	3.45	4.16
998.4	2.99	3.54	4.23
1018.6	3.11	3.64	4.31
1058.9	3.27	3.74	4.36
1079.1	3.33	3.74	4.33
1119.4	3.62	3.97	4.52
1139.6	3.76	4.09	4.61
1179.9	3.90	4.15	4.60
1200.1	4.01	4.26	4.69

IF (OUT) (MHz)	IF VSWR @LO=1200.1MHz (:1)		
	@LO (dBm)		
	+4	+7	+10
10.0	1.64	1.37	1.19
29.9	1.34	1.11	1.03
49.7	1.24	1.03	1.14
69.5	1.20	1.11	1.17
89.3	1.29	1.15	1.17
109.1	1.31	1.16	1.17
128.9	1.29	1.14	1.17
148.7	1.27	1.16	1.21
168.5	1.28	1.18	1.22
188.3	1.31	1.21	1.24
208.1	1.30	1.20	1.23
227.9	1.28	1.20	1.24
247.7	1.28	1.21	1.29
267.5	1.30	1.26	1.32
287.3	1.33	1.28	1.33
307.1	1.33	1.29	1.34
326.9	1.31	1.27	1.34
346.7	1.30	1.28	1.36
386.3	1.34	1.33	1.41
406.1	1.34	1.34	1.42
445.7	1.34	1.36	1.45
465.5	1.35	1.38	1.49
505.1	1.35	1.38	1.48
524.9	1.36	1.39	1.50
564.5	1.37	1.41	1.53
584.3	1.36	1.39	1.49
623.9	1.37	1.41	1.52
643.7	1.38	1.42	1.53
683.3	1.40	1.40	1.51
703.1	1.39	1.39	1.50
742.7	1.40	1.38	1.48
762.5	1.42	1.37	1.46
802.1	1.40	1.32	1.41
821.9	1.40	1.31	1.39
861.5	1.44	1.30	1.36
881.3	1.45	1.27	1.31
920.9	1.44	1.23	1.25
940.7	1.46	1.23	1.24
980.3	1.50	1.21	1.15
1000.1	1.49	1.19	1.10

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	4	16	11	30	14	28	36	45	45	51
1	-	18	0	37	11	32	34	51	50	43	65	55
2	109	59	45	57	44	57	47	64	52	66	70	73
3	113	67	67	68	65	69	63	83	89	81	89	79
4	120	95	92	90	95	90	98	92	92	92	93	96
5	119	99	120	107	108	111	95	109	102	117	96	111
6	128	125	108	102	124	94	101	85	104	100	108	105
7	112	107	108	99	106	131	97	97	87	101	102	98
8	116	107	99	104	105	106	102	100	97	85	96	111
9	111	109	122	100	99	107	109	106	100	98	96	99
10	120	106	106	105	104	105	119	118	122	99	92	90
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -14.00 dBm.
 LO IN: 530.01 MHz; +7.00 dBm
 IF OUT: 29.91 MHz; -19.53 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	13	28	23	42	27	39	49	54	54	63
1	-	19	0	34	12	33	35	52	52	49	65	61
2	94	47	38	59	38	49	39	61	44	58	61	73
3	110	44	43	51	42	52	40	54	65	68	70	63
4	109	76	61	59	53	57	53	57	57	67	62	70
5	142	71	70	84	58	61	58	62	61	74	77	76
6	112	84	92	90	78	82	73	84	91	73	77	81
7	113	87	95	91	83	75	72	73	74	73	74	86
8	112	93	89	95	101	92	81	77	76	76	77	80
9	109	115	100	96	100	98	98	87	81	86	85	85
10	113	117	113	104	102	110	112	109	94	89	94	94
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500.1 MHz; -4.00 dBm.
 LO IN: 530.01 MHz; +7.00 dBm
 IF OUT: 29.91 MHz; -9.52 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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