

# Frequency Mixer

# ADE-1ASK+

## 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	20.53	23.89	24.57	10.1	40.1	1.52	1.14	0.95
2.0	32.0	5.98	5.68	5.58	50.1	80.1	25.78	24.49	23.75	50.1	80.1	1.27	0.83	0.68
2.2	32.2	5.88	5.68	5.48	90.1	120.1	20.19	21.34	23.32	90.1	120.1	1.13	0.87	0.72
4.7	34.7	5.75	5.45	5.35	130.1	160.1	22.55	22.09	18.90	130.1	160.1	1.07	0.78	0.65
10.1	40.1	5.62	5.38	5.25	170.1	200.1	24.23	19.41	18.17	170.1	200.1	1.23	0.85	0.65
50.1	80.1	5.59	5.35	5.21	210.1	240.1	19.25	16.93	17.29	210.1	240.1	1.11	0.80	0.63
90.1	120.1	5.62	5.37	5.24	250.1	280.1	18.72	16.51	19.36	250.1	280.1	1.10	0.77	0.61
170.1	200.1	5.65	5.41	5.30	290.1	320.1	16.16	17.21	19.33	290.1	320.1	1.10	0.91	0.71
210.1	240.1	5.68	5.46	5.32	330.1	360.1	14.72	13.32	17.43	330.1	360.1	1.05	0.84	0.66
250.1	280.1	5.71	5.49	5.35	350.1	380.1	16.30	15.81	16.31	350.1	380.1	0.99	0.81	0.64
290.1	320.1	5.74	5.50	5.36	390.1	420.1	22.24	33.70	21.60	390.1	420.1	1.02	0.83	0.64
330.1	360.1	5.83	5.58	5.43	410.1	440.1	25.98	19.89	22.04	410.1	440.1	1.08	0.92	0.77
350.1	380.1	5.83	5.60	5.45	450.1	480.1	12.19	14.64	19.77	450.1	480.1	1.16	0.94	0.77
390.1	420.1	5.86	5.58	5.41	470.1	500.1	11.10	11.60	14.10	470.1	500.1	1.18	1.01	0.73
410.1	440.1	5.88	5.58	5.42	510.1	540.1	9.54	10.02	10.95	510.1	540.1	1.43	1.18	1.00
450.1	480.1	5.99	5.72	5.52	530.1	560.1	9.55	10.32	11.64	530.1	560.1	1.53	1.29	1.00
470.1	500.1	6.04	5.78	5.60	570.1	600.1	9.99	12.03	16.30	570.1	600.1	1.69	1.32	1.24
510.1	540.1	6.10	5.87	5.70	590.1	620.1	11.24	14.85	23.07	590.1	620.1	1.77	1.42	1.19
570.1	600.1	6.25	5.90	5.68	630.1	660.1	11.21	19.77	17.15	630.1	660.1	1.96	1.62	1.41
590.1	620.1	6.29	5.89	5.68	650.1	680.1	10.34	18.98	19.94	650.1	680.1	1.96	1.68	1.42
630.1	660.1	6.52	5.96	5.68	690.1	720.1	7.96	15.96	16.29	690.1	720.1	1.67	1.68	1.58
650.1	680.1	6.67	6.03	5.70	710.1	740.1	7.19	13.05	17.56	710.1	740.1	1.73	1.78	1.56
690.1	720.1	7.03	6.25	5.81	750.1	780.1	7.93	11.22	18.02	750.1	780.1	1.61	1.62	1.55
710.1	740.1	7.17	6.41	5.88	770.1	800.1	8.11	11.02	17.07	770.1	800.1	1.65	1.57	1.49
750.1	780.1	7.35	6.64	6.06	810.1	840.1	8.67	11.06	15.53	810.1	840.1	1.52	1.45	1.37
770.1	800.1	7.45	6.79	6.21	830.1	860.1	8.88	10.88	12.90	830.1	860.1	1.45	1.41	1.17
810.1	840.1	7.62	7.06	6.54	870.1	900.1	10.00	11.95	13.81	870.1	900.1	1.47	1.20	1.22
870.1	900.1	7.80	7.36	6.96	890.1	920.1	10.07	12.14	13.68	890.1	920.1	1.48	1.35	1.08
890.1	920.1	7.82	7.37	7.00	930.1	960.1	11.06	12.97	13.92	930.1	960.1	1.57	1.26	1.26
930.1	960.1	7.83	7.37	7.05	950.1	980.1	11.71	13.86	15.82	950.1	980.1	1.59	1.38	1.12
950.1	980.1	7.82	7.37	7.08	990.1	1020.1	12.09	14.74	14.33	990.1	1020.1	1.59	1.29	1.07
990.1	1020.1	7.81	7.42	7.18	1010.1	1040.1	12.96	14.75	15.30	1010.1	1040.1	1.57	1.22	1.10
1010.1	1040.1	7.89	7.51	7.30	1050.1	1080.1	11.07	12.28	13.70	1050.1	1080.1	1.42	1.23	0.98
1050.1	1080.1	8.03	7.70	7.52	1070.1	1100.1	10.29	11.54	12.12	1070.1	1100.1	1.44	1.15	0.94
1070.1	1100.1	8.17	7.87	7.72	1110.1	1140.1	9.93	11.12	11.95	1110.1	1140.1	1.41	0.94	0.75
1110.1	1140.1	8.47	8.18	8.08	1130.1	1160.1	10.03	11.22	11.57	1130.1	1160.1	1.40	0.83	0.70
1170.1	1200.1	9.10	8.85	8.79	1170.1	1200.1	10.74	11.29	13.01	1170.1	1200.1	1.27	0.75	0.67
1190.1	1220.1	9.33	9.07	9.02	1190.1	1220.1	10.71	13.12	13.22	1190.1	1220.1	1.21	0.87	0.57
1230.1	1260.1	9.90	9.63	9.57	1230.1	1260.1	10.85	13.23	15.40	1230.1	1260.1	1.11	0.71	0.60
1250.1	1280.1	10.22	9.93	9.84	1250.1	1280.1	9.67	13.21	14.28	1250.1	1280.1	1.14	0.77	0.60



# Frequency Mixer

# ADE-1ASK+

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=300.1MHz (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)=600.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+7			+7			+7
290.0	10.1	5.67	10.0	20.1	5.43	590.0	10.1	6.08
282.8	17.3	5.67	24.5	34.6	5.35	575.1	25.0	6.01
275.6	24.5	5.67	39.0	49.1	5.27	560.3	39.8	5.96
268.5	31.6	5.64	53.5	63.6	5.22	545.4	54.7	5.94
261.3	38.8	5.57	68.0	78.1	5.20	530.5	69.6	5.90
254.1	46.0	5.57	82.5	92.6	5.17	515.6	84.5	5.88
246.9	53.2	5.54	97.0	107.1	5.18	500.8	99.3	5.86
239.7	60.4	5.54	111.5	121.6	5.09	485.9	114.2	5.86
232.6	67.5	5.50	126.0	136.1	5.03	471.0	129.1	5.83
225.4	74.7	5.47	140.5	150.6	4.94	456.2	143.9	5.85
218.2	81.9	5.49	155.0	165.1	5.00	441.3	158.8	5.90
211.0	89.1	5.49	169.5	179.6	5.01	426.4	173.7	5.91
203.8	96.3	5.48	184.0	194.1	5.01	411.5	188.6	5.86
196.7	103.4	5.49	198.5	208.6	5.03	396.7	203.4	5.85
189.5	110.6	5.48	213.0	223.1	5.02	381.8	218.3	5.87
182.3	117.8	5.49	227.5	237.6	5.01	366.9	233.2	5.88
175.1	125.0	5.47	242.0	252.1	5.08	352.1	248.0	5.90
167.9	132.2	5.46	256.5	266.6	5.07	337.2	262.9	5.88
160.8	139.3	5.45	271.0	281.1	5.08	322.3	277.8	5.89
153.6	146.5	5.46	285.5	295.6	5.11	307.4	292.7	5.88
146.4	153.7	5.48	300.0	310.1	5.10	292.6	307.5	5.89
139.2	160.9	5.50	314.5	324.6	5.15	277.7	322.4	5.92
132.1	168.0	5.53	329.0	339.1	5.10	262.8	337.3	5.91
124.9	175.2	5.49	343.5	353.6	5.13	247.9	352.2	5.93
117.7	182.4	5.48	358.0	368.1	5.14	233.1	367.0	5.92
110.5	189.6	5.48	372.5	382.6	5.22	218.2	381.9	5.94
103.3	196.8	5.50	387.0	397.1	5.21	203.3	396.8	5.93
96.2	203.9	5.49	401.5	411.6	5.14	188.5	411.6	5.90
89.0	211.1	5.49	416.0	426.1	5.55	173.6	426.5	5.90
81.8	218.3	5.49	430.5	440.6	5.64	158.7	441.4	5.95
74.6	225.5	5.40	445.0	455.1	5.30	143.8	456.3	5.96
67.4	232.7	5.39	459.5	469.6	5.35	129.0	471.1	6.04
60.3	239.8	5.42	474.0	484.1	5.41	114.1	486.0	6.07
53.1	247.0	5.49	488.5	498.6	5.42	99.2	500.9	6.08
45.9	254.2	5.52	503.0	513.1	5.49	84.4	515.7	6.11
38.7	261.4	5.52	517.5	527.6	5.49	69.5	530.6	6.11
31.5	268.6	5.53	532.0	542.1	5.48	54.6	545.5	6.12
24.4	275.7	5.51	546.5	556.6	5.44	39.7	560.4	6.14
17.2	282.9	5.63	575.5	585.6	5.37	24.9	575.2	6.11
10.0	290.1	5.66	590.0	600.1	5.35	10.0	590.1	5.76

# Frequency Mixer

# ADE-1ASK+

## 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	65.70	67.70	70.60	65.50	64.10	62.90
2.0	65.40	67.90	70.30	65.40	64.20	62.60
2.2	64.80	67.90	69.50	65.70	64.00	62.50
4.7	64.50	66.90	69.60	65.00	64.10	62.50
10.1	66.91	72.51	77.06	58.18	51.70	64.23
50.1	67.72	76.48	88.12	55.41	53.98	53.76
90.1	61.36	66.99	77.09	49.85	49.00	48.46
170.1	54.35	59.13	64.29	43.96	43.64	43.40
210.1	52.13	56.36	60.24	42.31	41.90	41.69
250.1	50.06	53.78	56.67	41.01	40.61	40.31
290.1	48.58	51.80	54.34	39.77	39.48	38.83
330.1	46.17	49.18	51.69	38.74	38.40	37.77
350.1	44.93	47.49	49.79	38.27	37.58	37.07
390.1	43.50	45.40	46.93	37.57	36.94	36.19
410.1	43.13	45.04	46.47	37.14	36.47	35.72
450.1	42.91	44.38	44.88	36.01	35.04	34.21
470.1	42.44	43.60	44.00	35.46	34.17	33.23
510.1	41.71	42.57	42.71	34.86	33.18	31.84
570.1	40.26	41.12	41.00	33.69	31.80	30.39
590.1	39.72	40.66	40.58	33.22	31.25	29.65
630.1	38.55	39.58	39.22	31.65	29.70	28.20
650.1	37.84	38.79	38.65	30.81	28.98	27.58
690.1	36.07	36.88	37.04	28.79	27.30	26.05
710.1	35.17	35.95	36.13	28.07	26.36	25.15
750.1	33.54	34.37	34.63	27.23	25.48	24.03
770.1	33.06	33.84	34.11	26.77	25.04	23.52
810.1	32.32	33.12	33.33	25.82	24.08	22.61
870.1	31.14	31.82	32.08	24.70	23.08	21.66
890.1	30.82	31.43	31.63	24.13	22.61	21.11
930.1	30.05	30.48	30.36	23.37	21.87	20.27
950.1	29.63	29.89	29.61	23.04	21.49	19.82
990.1	28.72	28.48	27.83	22.04	20.47	18.72
1010.1	28.09	27.53	26.73	21.44	19.93	18.15
1050.1	27.03	25.88	24.96	20.56	19.07	17.39
1070.1	26.43	25.15	24.26	20.03	18.61	17.06
1110.1	25.10	23.61	22.69	18.86	17.76	16.41
1170.1	23.18	21.75	20.84	17.13	16.70	15.71
1190.1	22.54	21.09	20.22	16.60	16.28	15.44
1230.1	21.38	20.13	19.18	15.68	15.77	15.11
1250.1	20.82	19.58	18.67	15.23	15.40	14.87

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
10.1	40.1	42.01	38.27	36.20
50.1	80.1	33.78	33.97	33.74
90.1	120.1	28.98	29.35	29.64
130.1	160.1	26.85	26.63	26.88
170.1	200.1	25.05	25.36	25.53
210.1	240.1	24.04	24.27	24.40
250.1	280.1	23.53	23.86	24.06
290.1	320.1	23.36	23.91	24.26
330.1	360.1	23.46	23.77	24.15
350.1	380.1	23.55	23.82	24.14
390.1	420.1	23.96	24.53	24.91
410.1	440.1	24.04	24.92	25.58
450.1	480.1	23.95	24.93	25.76
470.1	500.1	23.52	24.10	24.71
510.1	540.1	21.76	21.93	22.07
530.1	560.1	20.72	20.76	20.69
570.1	600.1	18.91	18.75	18.59
590.1	620.1	18.32	18.13	18.02
630.1	660.1	17.55	17.41	17.39
650.1	680.1	17.35	17.32	17.36
690.1	720.1	17.12	17.15	17.31
710.1	740.1	17.19	17.16	17.30
750.1	780.1	17.26	17.06	17.04
770.1	800.1	17.23	16.96	16.88
810.1	840.1	17.13	16.81	16.60
830.1	860.1	16.97	16.68	16.42
870.1	900.1	16.54	16.22	15.93
890.1	920.1	16.16	15.91	15.59
930.1	960.1	15.30	15.04	14.90
950.1	980.1	14.66	14.46	14.32
990.1	1020.1	13.45	13.27	13.13
1010.1	1040.1	12.75	12.58	12.36
1050.1	1080.1	11.55	11.30	10.98
1070.1	1100.1	10.92	10.61	10.28
1110.1	1140.1	9.72	9.35	9.01
1130.1	1160.1	9.16	8.77	8.41
1170.1	1200.1	8.16	7.76	7.34
1190.1	1220.1	7.70	7.28	6.90
1230.1	1260.1	6.90	6.49	6.09
1250.1	1280.1	6.49	6.08	5.72

# Frequency Mixer

# ADE-1ASK+

## 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
10.1	40.1	1.33	1.36	1.19
50.1	80.1	1.07	1.04	1.07
90.1	120.1	1.13	1.07	1.05
170.1	200.1	1.12	1.06	1.05
210.1	240.1	1.06	1.04	1.08
250.1	280.1	1.09	1.07	1.09
290.1	320.1	1.06	1.06	1.10
330.1	360.1	1.10	1.09	1.11
350.1	380.1	1.10	1.09	1.11
390.1	420.1	1.12	1.14	1.18
410.1	440.1	1.12	1.14	1.19
450.1	480.1	1.11	1.12	1.17
470.1	500.1	1.11	1.13	1.18
510.1	540.1	1.09	1.10	1.12
570.1	600.1	1.12	1.11	1.13
590.1	620.1	1.13	1.11	1.12
630.1	660.1	1.21	1.18	1.18
650.1	680.1	1.28	1.24	1.24
690.1	720.1	1.42	1.36	1.33
710.1	740.1	1.50	1.44	1.41
750.1	780.1	1.71	1.63	1.57
770.1	800.1	1.76	1.69	1.62
810.1	840.1	1.93	1.87	1.81
870.1	900.1	2.15	2.10	2.05
890.1	920.1	2.24	2.20	2.15
930.1	960.1	2.36	2.31	2.26
950.1	980.1	2.33	2.29	2.23
990.1	1020.1	2.45	2.41	2.37
1010.1	1040.1	2.50	2.45	2.40
1050.1	1080.1	2.48	2.44	2.40
1070.1	1100.1	2.56	2.51	2.46
1110.1	1140.1	2.53	2.47	2.42
1170.1	1200.1	2.57	2.51	2.45
1190.1	1220.1	2.51	2.43	2.37
1230.1	1260.1	2.49	2.42	2.36
1250.1	1280.1	2.48	2.39	2.33

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
10.1	1.86	2.59	3.62
50.1	1.86	2.72	3.84
90.1	1.78	2.57	3.58
170.1	1.80	2.59	3.60
210.1	1.82	2.60	3.60
250.1	1.86	2.65	3.65
290.1	1.85	2.61	3.58
330.1	1.92	2.71	3.69
350.1	1.94	2.72	3.70
390.1	1.95	2.71	3.66
410.1	1.98	2.73	3.68
450.1	2.04	2.80	3.73
470.1	2.05	2.81	3.75
510.1	2.11	2.88	3.83
570.1	2.16	2.88	3.77
590.1	2.18	2.89	3.78
630.1	2.27	2.96	3.84
650.1	2.31	2.98	3.84
690.1	2.40	3.09	3.91
710.1	2.44	3.15	3.97
750.1	2.48	3.19	4.01
770.1	2.50	3.21	4.02
810.1	2.56	3.27	4.09
870.1	2.60	3.27	4.05
890.1	2.62	3.29	4.06
930.1	2.66	3.30	4.04
950.1	2.66	3.27	4.00
990.1	2.66	3.24	3.90
1010.1	2.67	3.24	3.88
1050.1	2.69	3.21	3.83
1070.1	2.69	3.19	3.80
1110.1	2.76	3.25	3.82
1170.1	2.89	3.31	3.83
1190.1	2.93	3.33	3.81
1230.1	3.06	3.41	3.85
1250.1	3.08	3.43	3.84

IF (OUT) (MHz)	IF VSWR @LO=600.1MHz (:1)		
	@LO (dBm)		
	+4	+7	+10
10.0	1.57	1.63	1.41
24.8	1.71	1.48	1.26
39.5	1.61	1.36	1.27
54.3	1.58	1.35	1.21
69.0	1.58	1.36	1.21
83.8	1.60	1.41	1.23
98.5	1.66	1.45	1.30
113.3	1.69	1.46	1.31
128.0	1.70	1.44	1.29
142.8	1.65	1.43	1.26
157.5	1.63	1.43	1.28
172.3	1.64	1.43	1.29
187.0	1.66	1.45	1.30
201.8	1.67	1.45	1.31
216.5	1.68	1.46	1.31
231.3	1.65	1.45	1.31
246.0	1.66	1.45	1.31
260.8	1.65	1.46	1.32
275.5	1.68	1.48	1.34
290.3	1.69	1.49	1.36
305.0	1.69	1.49	1.35
319.8	1.70	1.49	1.37
334.5	1.70	1.50	1.36
349.3	1.68	1.50	1.38
364.0	1.71	1.52	1.39
378.8	1.72	1.54	1.42
393.5	1.74	1.55	1.44
408.3	1.75	1.57	1.45
423.0	1.74	1.56	1.46
437.8	1.75	1.57	1.47
452.5	1.76	1.59	1.49
467.3	1.77	1.61	1.51
482.0	1.78	1.62	1.52
496.8	1.81	1.64	1.54
511.5	1.81	1.65	1.55
526.3	1.81	1.66	1.56
541.0	1.82	1.68	1.58
555.8	1.84	1.69	1.61
585.3	1.86	1.72	1.64
600.0	1.91	1.98	2.07

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	5	14	12	31	18	33	43	52	33	48
1	-	16	0	33	12	31	40	46	46	51	54	59
2	116	68	44	58	43	73	50	63	55	62	79	73
3	117	65	56	62	55	64	56	75	74	84	75	85
4	117	97	97	88	87	86	84	90	96	89	102	92
5	115	109	103	101	91	93	85	89	90	106	104	115
6	111	100	106	103	104	103	118	84	99	109	111	108
7	117	111	103	112	100	103	95	96	94	104	107	102
8	120	108	113	106	110	106	96	97	98	92	103	110
9	111	116	111	106	111	104	106	96	96	100	103	110
10	118	125	106	108	104	108	104	113	115	110	86	95
	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: 530.1 MHz; +7.00 dBm  
 IF OUT: 30 MHz; -19.63 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	26	23	42	30	44	54	65	44	67
1	-	16	0	31	13	34	39	50	54	57	58	68
2	95	46	39	56	39	48	42	58	47	61	69	69
3	115	44	38	51	40	63	41	51	65	64	62	71
4	120	68	62	68	53	57	52	57	60	65	66	68
5	106	71	70	73	53	57	51	59	55	75	70	77
6	108	81	88	79	77	73	69	79	80	69	77	78
7	129	94	92	94	83	86	70	71	65	68	67	88
8	118	106	92	89	96	90	83	78	73	75	74	83
9	116	111	104	104	104	124	100	92	82	87	82	82
10	119	112	107	114	110	101	109	97	92	90	86	90
	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: 530.1 MHz; +7.00 dBm  
 IF OUT: 30 MHz; -9.61 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. X2  
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 Page 5 of 5



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