

Frequency Mixer

TAK-1H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+14	+17	+20
2.0	32.0	6.99	6.30	5.96
5.0	35.0	6.55	5.95	5.64
10.0	40.0	6.49	5.92	5.61
30.4	60.4	7.15	6.44	6.09
50.6	80.6	7.11	6.46	6.14
70.9	100.9	7.01	6.41	6.12
91.1	121.1	7.07	6.42	6.12
111.4	141.4	6.97	6.34	6.12
131.6	161.6	6.81	6.34	6.13
151.9	181.9	6.86	6.36	6.14
172.2	202.2	6.79	6.35	6.13
192.4	222.4	6.74	6.34	6.15
212.7	242.7	6.71	6.32	6.14
232.9	262.9	6.72	6.36	6.16
253.2	283.2	6.70	6.36	6.17
273.4	303.4	6.76	6.38	6.20
293.7	323.7	6.78	6.42	6.21
313.9	343.9	6.84	6.52	6.31
334.2	364.2	6.91	6.57	6.35
354.5	384.5	6.89	6.57	6.37
374.7	404.7	6.95	6.59	6.39
395.0	425.0	6.99	6.60	6.36
415.2	445.2	6.99	6.66	6.40
435.5	465.5	7.01	6.72	6.48
455.7	485.7	7.09	6.80	6.61
476.0	506.0	7.18	6.91	6.72
496.3	526.3	7.19	6.93	6.75
516.5	546.5	7.43	7.12	6.91
537.0	567.0	7.73	7.30	6.99
557.3	587.3	8.00	7.38	6.97
577.5	607.5	8.35	7.49	6.97
597.8	627.8	8.71	7.58	6.95
618.0	648.0	9.25	7.96	7.04
638.3	668.3	9.76	8.39	7.17
658.6	688.6	10.19	8.74	7.27
678.8	708.8	10.65	9.15	7.50
699.1	729.1	11.08	9.58	7.89
719.4	749.4	11.47	10.02	8.35
739.7	769.7	11.55	10.18	8.57
759.9	789.9	11.42	10.26	8.79

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	26.72	29.56	30.35
30.4	60.4	25.30	29.09	30.05
50.6	80.6	27.08	29.83	29.62
70.9	100.9	30.77	29.52	31.51
91.1	121.1	25.18	27.20	32.58
111.4	141.4	27.93	32.75	35.14
131.6	161.6	27.95	30.29	33.08
151.9	181.9	26.49	30.08	31.52
172.2	202.2	27.44	37.02	28.32
192.4	222.4	28.55	30.54	27.07
212.7	242.7	32.09	33.29	27.38
232.9	262.9	30.17	28.28	28.04
253.2	283.2	28.94	24.76	23.34
273.4	303.4	28.40	24.90	22.77
293.7	323.7	25.65	23.19	23.55
313.9	343.9	25.40	21.78	22.06
334.2	364.2	28.28	22.60	21.36
354.5	384.5	29.25	26.63	23.98
374.7	404.7	30.80	31.71	26.82
395.0	425.0	23.65	35.82	27.81
415.2	445.2	21.30	23.44	27.74
435.5	465.5	19.96	19.86	22.33
455.7	485.7	19.97	18.53	18.79
476.0	506.0	19.46	17.97	17.70
496.3	526.3	20.00	18.06	17.59
516.5	546.5	18.79	17.43	17.24
536.8	566.8	18.76	17.41	17.68
557.0	587.0	17.65	17.32	18.74
577.3	607.3	16.52	17.82	20.30
597.5	627.5	15.39	18.62	21.54
617.8	647.8	13.81	18.83	22.21
638.0	668.0	12.58	18.12	23.67
658.3	688.3	11.38	15.82	24.18
678.6	708.6	11.16	14.77	24.81
698.8	728.8	10.94	13.48	21.89
719.1	749.1	11.02	13.08	19.89
739.3	769.3	11.25	13.03	18.78
759.6	789.6	11.49	13.08	17.85
779.8	809.8	12.00	13.47	18.07
800.1	830.1	12.90	13.95	17.59

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	0.95	0.52	0.32
30.4	60.4	0.65	0.42	0.28
50.6	80.6	0.75	0.45	0.26
70.9	100.9	0.90	0.41	0.25
91.1	121.1	0.76	0.45	0.24
111.4	141.4	0.77	0.38	0.19
131.6	161.6	0.87	0.40	0.20
151.9	181.9	0.87	0.41	0.21
172.2	202.2	0.91	0.37	0.19
192.4	222.4	0.92	0.37	0.19
212.7	242.7	0.91	0.38	0.21
232.9	262.9	1.01	0.37	0.22
253.2	283.2	0.96	0.37	0.23
273.4	303.4	0.93	0.37	0.26
293.7	323.7	0.91	0.37	0.28
313.9	343.9	0.87	0.29	0.22
334.2	364.2	0.93	0.34	0.23
354.5	384.5	0.93	0.40	0.26
374.7	404.7	0.94	0.44	0.29
395.0	425.0	0.98	0.53	0.38
415.2	445.2	1.15	0.64	0.51
435.5	465.5	1.34	0.74	0.58
455.7	485.7	1.40	0.80	0.62
476.0	506.0	1.52	0.94	0.73
496.3	526.3	1.57	1.00	0.75
516.5	546.5	1.89	1.22	0.90
536.8	566.8	1.96	1.28	0.93
557.0	587.0	2.10	1.37	0.97
577.3	607.3	2.07	1.41	1.03
597.5	627.5	2.06	1.60	1.17
617.8	647.8	1.84	1.72	1.32
638.0	668.0	1.51	1.59	1.37
658.3	688.3	1.15	1.33	1.45
678.6	708.6	0.75	1.02	1.41
698.8	728.8	0.44	0.77	1.41
719.1	749.1	-0.05	0.44	1.15
739.3	769.3	-0.31	0.15	0.94
759.6	789.6	-0.43	0.08	0.84
779.8	809.8	-0.47	-0.07	0.68
800.1	830.1	-0.43	-0.23	0.42

REV. X2

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Frequency Mixer

TAK-1H+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (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)=500.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
240.0	10.1	6.63	10.0	20.1	6.24	490.0	10.1	7.07
234.1	16.0	6.64	22.3	32.4	6.18	477.7	22.4	6.96
228.2	21.9	6.49	34.6	44.7	6.18	465.4	34.7	6.88
222.3	27.8	6.53	46.9	57.0	6.17	453.1	47.0	6.89
216.4	33.7	6.49	59.2	69.3	6.08	440.8	59.3	6.89
210.5	39.6	6.44	71.5	81.6	6.15	428.5	71.6	6.76
204.6	45.5	6.51	83.8	93.9	6.19	416.2	83.9	6.65
198.7	51.4	6.41	96.2	106.3	6.15	403.8	96.3	6.52
192.8	57.3	6.38	108.5	118.6	6.16	391.5	108.6	6.43
186.9	63.2	6.37	120.8	130.9	6.11	379.2	120.9	6.42
181.0	69.1	6.35	133.1	143.2	6.11	366.9	133.2	6.38
175.1	75.0	6.44	145.4	155.5	6.22	354.6	145.5	6.30
169.2	80.9	6.37	157.7	167.8	6.25	342.3	157.8	6.33
163.3	86.8	6.34	170.0	180.1	6.24	330.0	170.1	6.34
157.4	92.7	6.36	182.3	192.4	6.23	317.7	182.4	6.31
151.5	98.6	6.23	194.6	204.7	6.22	305.4	194.7	6.36
145.6	104.5	6.28	206.9	217.0	6.23	293.1	207.0	6.34
139.7	110.4	6.25	219.2	229.3	6.29	280.8	219.3	6.35
133.8	116.3	6.16	231.5	241.6	6.27	268.5	231.6	6.42
127.9	122.2	6.12	243.8	253.9	6.30	256.2	243.9	6.43
122.1	128.0	6.08	256.2	266.3	6.40	243.8	256.3	6.51
116.2	133.9	6.11	268.5	278.6	6.37	231.5	268.6	6.55
110.3	139.8	6.15	280.8	290.9	6.37	219.2	280.9	6.53
104.4	145.7	6.14	293.1	303.2	6.38	206.9	293.2	6.59
98.5	151.6	6.15	305.4	315.5	6.36	194.6	305.5	6.61
92.6	157.5	6.12	317.7	327.8	6.44	182.3	317.8	6.61
86.7	163.4	6.13	330.0	340.1	6.50	170.0	330.1	6.64
80.8	169.3	6.16	342.3	352.4	6.48	157.7	342.4	6.63
74.9	175.2	6.15	354.6	364.7	6.55	145.4	354.7	6.62
69.0	181.1	6.17	366.9	377.0	6.60	133.1	367.0	6.64
63.1	187.0	6.14	379.2	389.3	6.56	120.8	379.3	6.61
57.2	192.9	6.15	391.5	401.6	6.61	108.5	391.6	6.59
51.3	198.8	6.17	403.8	413.9	6.57	96.2	403.9	6.63
45.4	204.7	6.20	416.2	426.3	6.67	83.8	416.3	6.64
39.5	210.6	6.24	428.5	438.6	6.87	71.5	428.6	6.71
33.6	216.5	6.24	440.8	450.9	6.94	59.2	440.9	6.78
27.7	222.4	6.24	453.1	463.2	7.04	46.9	453.2	6.81
21.8	228.3	6.27	465.4	475.5	7.00	34.6	465.5	6.88
15.9	234.2	6.31	477.7	487.8	6.95	22.3	477.8	6.92
10.0	240.1	6.33	490.0	500.1	7.01	10.0	490.1	6.93

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+14	+17	+20	+14	+17	+20
2.0	59.73	62.98	64.42	49.91	52.28	53.48
5.0	58.95	62.06	63.57	50.65	52.79	53.94
10.0	53.36	60.47	61.17	50.51	52.35	53.27
30.4	78.58	76.61	75.21	59.49	58.17	57.15
50.6	75.39	73.36	72.68	55.66	54.57	54.33
70.9	73.08	71.35	69.60	53.01	51.63	51.12
91.1	71.93	70.41	69.10	50.53	49.65	48.91
111.4	70.49	68.45	67.77	48.88	47.79	46.99
131.6	69.41	68.20	67.62	47.41	45.82	45.83
151.9	68.58	67.28	65.97	45.89	44.68	44.84
172.2	68.18	66.83	65.59	44.39	43.72	44.17
192.4	68.19	66.14	64.54	43.33	43.27	43.98
212.7	67.14	66.62	65.57	42.04	42.37	43.04
232.9	65.93	65.24	64.51	41.68	42.26	42.97
253.2	64.26	62.93	61.53	41.51	42.27	42.51
273.4	65.08	63.46	62.50	40.36	41.14	41.72
293.7	64.57	62.88	61.71	40.64	41.45	41.83
313.9	64.03	63.39	62.64	41.15	41.84	41.42
334.2	62.88	63.41	63.47	39.60	40.74	40.74
354.5	59.40	60.02	61.27	39.43	40.38	40.76
374.7	58.32	58.95	59.56	39.58	39.91	40.00
395.0	56.82	58.13	60.31	39.15	39.04	38.89
415.2	54.74	55.67	56.48	40.15	38.60	37.47
435.5	54.93	56.68	59.40	41.19	39.14	36.52
455.7	55.02	56.65	57.27	40.10	39.91	37.01
476.0	54.01	54.90	57.86	40.40	39.90	37.87
496.3	56.01	57.33	59.35	41.08	39.93	38.51
516.5	58.86	59.77	61.24	39.81	38.61	37.72
537.0	64.87	60.26	55.31	39.36	36.80	35.83
557.3	58.62	51.52	46.10	37.56	34.56	33.62
577.5	56.81	50.55	46.55	37.29	33.19	31.74
597.8	54.41	47.92	44.27	37.34	32.29	30.57
618.0	50.71	45.39	43.64	38.09	31.51	29.66
638.3	50.22	46.28	44.54	38.75	32.22	29.15
658.6	46.11	43.73	42.31	37.01	33.41	29.28
678.8	46.78	46.09	45.21	35.65	33.75	29.02
699.1	44.12	42.22	39.82	34.17	33.47	29.39
719.4	43.34	41.73	39.10	31.76	31.77	30.31
739.7	43.24	42.67	41.53	30.69	30.72	29.90
759.9	43.96	42.74	40.05	29.68	29.90	29.48

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	42.42	40.70	41.07
30.4	60.4	37.69	37.98	37.84
50.6	80.6	34.60	34.57	34.75
70.9	100.9	32.18	32.48	32.51
91.1	121.1	30.57	30.90	31.09
111.4	141.4	29.22	29.52	29.82
131.6	161.6	28.29	28.52	28.64
151.9	181.9	27.30	27.69	27.98
172.2	202.2	26.71	27.00	27.24
192.4	222.4	26.23	26.54	26.76
212.7	242.7	25.85	26.21	26.44
232.9	262.9	25.45	25.96	26.28
253.2	283.2	25.13	25.65	26.00
273.4	303.4	24.65	25.36	25.87
293.7	323.7	24.59	25.24	25.78
313.9	343.9	24.56	25.00	25.37
334.2	364.2	24.63	25.02	25.29
354.5	384.5	24.62	24.98	25.22
374.7	404.7	24.47	24.91	25.16
395.0	425.0	24.37	25.06	25.61
415.2	445.2	23.94	24.68	25.45
435.5	465.5	23.68	24.52	25.49
455.7	485.7	23.28	24.02	24.79
476.0	506.0	22.92	23.53	24.22
496.3	526.3	22.59	23.05	23.57
516.5	546.5	22.08	22.46	22.82
536.8	566.8	21.68	22.03	22.28
557.0	587.0	21.16	21.52	21.76
577.3	607.3	20.71	21.02	21.21
597.5	627.5	20.18	20.45	20.53
617.8	647.8	19.79	19.89	19.90
638.0	668.0	19.64	19.66	19.58
658.3	688.3	19.52	19.64	19.53
678.6	708.6	19.46	19.68	19.45
698.8	728.8	19.42	19.91	20.01
719.1	749.1	19.38	19.71	20.09
739.3	769.3	19.52	19.98	20.68
759.6	789.6	19.72	19.91	20.43
779.8	809.8	19.94	20.04	20.46
800.1	830.1	20.21	20.22	20.34

Frequency Mixer

TAK-1H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=500.5MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
5.0	35.0	1.28	1.22	1.25	5.0	1.27	1.67	2.71	5.0	1.51	1.33	1.25
10.0	40.0	1.20	1.10	1.14	10.0	1.20	1.60	2.58	10.0	1.51	1.34	1.25
30.4	60.4	1.22	1.08	1.02	30.4	1.06	1.62	2.39	22.6	2.33	2.03	1.85
50.6	80.6	1.19	1.05	1.03	50.6	1.06	1.60	2.36	35.1	2.21	1.97	1.78
70.9	100.9	1.15	1.03	1.06	70.9	1.02	1.53	2.21	47.7	2.09	1.93	1.71
91.1	121.1	1.17	1.04	1.08	91.1	1.04	1.52	2.21	60.3	2.05	1.93	1.70
111.4	141.4	1.13	1.04	1.12	111.4	1.05	1.54	2.23	72.8	2.07	1.94	1.72
131.6	161.6	1.11	1.05	1.12	131.6	1.04	1.58	2.31	85.4	2.13	1.96	1.76
151.9	181.9	1.12	1.05	1.12	151.9	1.05	1.57	2.27	97.9	2.22	2.00	1.81
172.2	202.2	1.10	1.07	1.15	172.2	1.04	1.54	2.21	110.5	2.26	2.02	1.83
192.4	222.4	1.08	1.09	1.16	192.4	1.03	1.55	2.22	123.1	2.30	2.06	1.86
212.7	242.7	1.08	1.09	1.18	212.7	1.04	1.60	2.29	135.6	2.27	2.06	1.86
232.9	262.9	1.07	1.10	1.18	232.9	1.06	1.63	2.33	148.2	2.23	2.05	1.84
253.2	283.2	1.06	1.11	1.19	253.2	1.07	1.62	2.30	160.8	2.22	2.05	1.85
273.4	303.4	1.06	1.11	1.19	273.4	1.09	1.64	2.31	173.3	2.27	2.09	1.88
293.7	323.7	1.06	1.11	1.19	293.7	1.11	1.65	2.32	185.9	2.35	2.14	1.94
313.9	343.9	1.05	1.11	1.18	313.9	1.13	1.70	2.38	198.5	2.41	2.18	1.97
334.2	364.2	1.05	1.12	1.18	334.2	1.17	1.74	2.42	211.0	2.44	2.19	1.99
354.5	384.5	1.05	1.14	1.21	354.5	1.19	1.73	2.40	223.6	2.43	2.18	1.98
374.7	404.7	1.06	1.18	1.25	374.7	1.21	1.74	2.40	236.2	2.40	2.17	1.96
395.0	425.0	1.05	1.20	1.30	395.0	1.25	1.78	2.44	248.7	2.40	2.19	1.97
415.2	445.2	1.06	1.19	1.31	415.2	1.28	1.83	2.49	261.3	2.43	2.22	2.00
435.5	465.5	1.07	1.19	1.30	435.5	1.32	1.87	2.52	273.8	2.48	2.26	2.03
455.7	485.7	1.08	1.19	1.28	455.7	1.34	1.89	2.57	286.4	2.52	2.28	2.05
476.0	506.0	1.10	1.20	1.28	476.0	1.36	1.90	2.55	299.0	2.54	2.28	2.07
496.3	526.3	1.11	1.21	1.27	496.3	1.40	1.94	2.60	311.5	2.57	2.30	2.08
516.5	546.5	1.10	1.20	1.25	516.5	1.45	1.99	2.65	324.1	2.57	2.31	2.09
536.8	566.8	1.09	1.18	1.22	536.8	1.48	2.00	2.64	336.7	2.59	2.34	2.11
557.0	587.0	1.09	1.16	1.17	557.0	1.52	2.03	2.62	349.2	2.61	2.37	2.14
577.3	607.3	1.10	1.12	1.10	577.3	1.56	2.03	2.63	361.8	2.65	2.41	2.18
597.5	627.5	1.13	1.08	1.05	597.5	1.62	2.08	2.68	374.4	2.68	2.43	2.19
617.8	647.8	1.19	1.10	1.05	617.8	1.67	2.13	2.72	386.9	2.73	2.45	2.22
638.0	668.0	1.26	1.16	1.11	638.0	1.72	2.19	2.75	399.5	2.79	2.50	2.25
658.3	688.3	1.35	1.24	1.17	658.3	1.75	2.24	2.80	412.1	2.85	2.55	2.29
678.6	708.6	1.44	1.33	1.24	678.6	1.78	2.31	2.87	424.6	2.86	2.57	2.31
698.8	728.8	1.56	1.44	1.33	698.8	1.83	2.37	2.95	437.2	2.85	2.57	2.31
719.1	749.1	1.68	1.56	1.44	719.1	1.86	2.41	3.00	449.7	2.89	2.60	2.34
739.3	769.3	1.80	1.68	1.55	739.3	1.92	2.48	3.05	462.3	2.97	2.67	2.39
759.6	789.6	1.90	1.79	1.66	759.6	1.92	2.44	3.04	474.9	3.06	2.74	2.45
779.8	809.8	2.01	1.91	1.76	779.8	1.97	2.49	3.09	487.4	3.11	2.78	2.49
800.1	830.1	2.09	1.99	1.86	800.1	2.01	2.53	3.13	500.0	2.83	2.55	2.30

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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	36	24	41	25	42	28	60	26	43
1	-	20	+0	32	14	43	22	36	39	45	27	58
2	97	71	54	79	54	67	53	71	52	66	56	76
3	>100	61	53	67	59	71	48	69	48	67	56	80
4	>100	85	79	91	78	>93	72	85	71	92	80	>93
5	>100	85	77	84	76	82	69	82	67	91	67	85
6	>100	>93	88	>93	87	>93	83	>93	84	>93	84	>93
7	>100	>93	93	>93	89	>93	85	90	85	>93	89	>93
8	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
9	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
10	>100	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93	>93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 250.1 MHz; -1.00 dBm.
LO IN: 280.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -7.23 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	26	47	37	52	40	58	47	62	44	74
1	-	20	+0	33	14	56	22	39	43	51	39	62
2	78	71	51	65	53	68	52	72	47	66	51	71
3	>100	51	42	54	45	58	41	55	49	57	53	61
4	>100	80	64	88	63	80	63	75	63	75	61	76
5	>100	71	54	70	58	70	53	66	49	80	49	66
6	>100	92	71	81	70	84	73	89	71	84	70	85
7	>100	76	73	74	61	71	67	77	61	77	58	84
8	>100	96	86	100	82	90	82	89	85	96	77	89
9	>100	85	80	89	91	82	76	85	70	79	65	80
10	>100	95	102	>103	92	95	97	96	92	>103	81	103
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 250.1 MHz; 9.00 dBm.
LO IN: 280.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 2.71 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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