

Frequency Mixer

TAK-3H+

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=+14dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+14	+17	+20			+14	+17	+20			+14	+17	+20
0.1	30.1	6.39	5.81	5.56	10.1	40.1	31.08	28.29	27.62	10.1	40.1	1.23	0.78	0.55
1.0	31.0	5.32	4.70	4.51	22.7	52.7	32.27	27.51	25.95	22.7	52.7	0.99	0.64	0.45
2.0	32.0	5.23	4.63	4.45	35.2	65.2	27.65	26.21	25.01	35.2	65.2	1.06	0.65	0.42
10.0	40.0	5.24	4.79	4.59	47.8	77.8	27.27	24.88	24.83	47.8	77.8	1.01	0.62	0.40
22.7	52.7	5.64	5.26	5.07	60.4	90.4	26.83	24.27	26.73	60.4	90.4	1.01	0.56	0.39
35.2	65.2	5.66	5.29	5.11	72.9	102.9	23.08	23.30	26.61	72.9	102.9	0.95	0.55	0.36
47.8	77.8	5.69	5.34	5.14	85.5	115.5	22.16	21.94	25.75	85.5	115.5	1.02	0.50	0.31
60.4	90.4	5.64	5.29	5.12	98.0	128.0	22.86	24.54	28.86	98.0	128.0	0.96	0.45	0.30
72.9	102.9	5.65	5.32	5.12	110.6	140.6	22.97	31.79	27.24	110.6	140.6	0.95	0.46	0.32
85.5	115.5	5.65	5.30	5.13	123.2	153.2	21.68	26.64	30.77	123.2	153.2	0.91	0.53	0.33
98.0	128.0	5.62	5.32	5.14	135.7	165.7	20.85	23.66	32.22	135.7	165.7	0.86	0.49	0.38
110.6	140.6	5.58	5.29	5.15	148.3	178.3	20.74	23.80	25.53	148.3	178.3	0.80	0.35	0.33
123.2	153.2	5.66	5.27	5.13	160.9	190.9	22.01	24.85	26.49	160.9	190.9	0.95	0.36	0.26
135.7	165.7	5.83	5.38	5.13	173.4	203.4	21.53	24.95	28.59	173.4	203.4	1.08	0.46	0.33
148.3	178.3	5.89	5.56	5.29	186.0	216.0	19.82	24.75	27.37	186.0	216.0	1.32	0.60	0.38
160.9	190.9	5.86	5.59	5.42	198.6	228.6	19.16	25.46	28.80	198.6	228.6	1.50	0.82	0.46
173.4	203.4	5.84	5.59	5.45	211.1	241.1	20.96	26.85	21.97	211.1	241.1	1.40	1.03	0.51
186.0	216.0	5.85	5.58	5.44	223.7	253.7	21.99	23.64	22.17	223.7	253.7	1.22	1.17	0.62
198.6	228.6	5.90	5.52	5.39	236.3	266.3	17.57	19.58	21.98	236.3	266.3	1.22	1.10	0.86
211.1	241.1	6.16	5.61	5.44	248.8	278.8	16.10	15.61	18.44	248.8	278.8	1.31	1.14	0.96
236.3	266.3	6.85	6.24	5.67	261.4	291.4	16.10	14.56	14.40	261.4	291.4	1.47	1.25	0.94
248.8	278.8	7.01	6.53	6.01	273.9	303.9	16.39	14.70	13.84	273.9	303.9	1.68	1.35	1.02
261.4	291.4	6.98	6.59	6.29	286.5	316.5	16.16	15.03	14.37	286.5	316.5	1.78	1.41	1.12
273.9	303.9	7.08	6.74	6.48	299.1	329.1	16.71	15.93	15.56	299.1	329.1	1.60	1.22	0.96
286.5	316.5	7.12	6.80	6.54	311.6	341.6	16.31	15.91	16.06	311.6	341.6	1.67	1.21	0.99
299.1	329.1	7.32	7.02	6.77	324.2	354.2	17.19	16.90	17.42	324.2	354.2	1.60	1.09	0.93
311.6	341.6	7.51	7.21	6.94	336.8	366.8	17.13	17.24	17.34	336.8	366.8	1.44	0.97	0.93
336.8	366.8	7.83	7.46	6.92	349.3	379.3	17.40	17.31	17.02	349.3	379.3	1.45	1.03	1.07
349.3	379.3	7.79	7.30	6.65	361.9	391.9	18.45	17.56	18.17	361.9	391.9	1.33	1.06	1.05
361.9	391.9	8.11	7.37	6.69	374.5	404.5	18.24	16.47	18.79	374.5	404.5	1.47	1.33	1.19
374.5	404.5	7.95	7.05	6.58	387.0	417.0	20.11	16.55	20.12	387.0	417.0	1.63	1.45	1.15
387.0	417.0	7.95	7.03	6.73	399.6	429.6	19.55	17.10	22.05	399.6	429.6	1.84	1.67	1.21
399.6	429.6	8.12	7.03	6.74	412.2	442.2	23.10	18.00	23.22	412.2	442.2	2.11	1.68	1.10
412.2	442.2	8.09	7.10	6.93	424.7	454.7	22.50	19.36	23.76	424.7	454.7	2.12	1.74	1.20
437.3	467.3	8.44	7.36	7.26	437.3	467.3	21.20	19.98	22.41	437.3	467.3	2.34	1.78	1.13
449.8	479.8	9.12	7.81	7.72	449.8	479.8	20.90	20.25	22.13	449.8	479.8	2.33	1.70	1.00
462.4	492.4	9.53	8.02	8.05	462.4	492.4	20.56	19.96	22.01	462.4	492.4	2.23	1.67	0.89
475.0	505.0	10.75	8.73	8.79	475.0	505.0	21.55	20.75	22.50	475.0	505.0	1.81	1.54	0.67
487.5	517.5	11.78	9.10	9.16	487.5	517.5	24.89	20.42	21.97	487.5	517.5	1.73	1.71	0.69
500.1	530.1	12.65	9.83	9.92	500.1	530.1	23.02	20.24	21.02	500.1	530.1	1.79	1.72	0.56

Frequency Mixer

TAK-3H+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=150.1MHz (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)=300.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+17			+17			+17
140.0	10.1	5.48	10.0	20.1	5.11	290.0	10.1	6.89
136.7	13.4	5.50	17.2	27.3	5.11	282.8	17.3	6.74
133.3	16.8	5.49	24.4	34.5	4.97	275.6	24.5	6.56
130.0	20.1	5.42	31.5	41.6	4.98	268.5	31.6	6.50
126.7	23.4	5.36	38.7	48.8	5.00	261.3	38.8	6.39
123.3	26.8	5.40	45.9	56.0	5.06	254.1	46.0	6.33
120.0	30.1	5.33	53.1	63.2	5.07	246.9	53.2	6.25
116.7	33.4	5.24	60.3	70.4	5.06	239.7	60.4	6.21
113.3	36.8	5.15	67.4	77.5	5.11	232.6	67.5	6.16
110.0	40.1	5.13	74.6	84.7	5.14	225.4	74.7	6.06
106.7	43.4	5.18	81.8	91.9	5.18	218.2	81.9	6.00
103.3	46.8	5.13	89.0	99.1	5.19	211.0	89.1	5.98
100.0	50.1	5.10	96.2	106.3	5.21	203.8	96.3	5.99
96.7	53.4	5.09	103.3	113.4	5.25	196.7	103.4	5.99
93.3	56.8	5.10	110.5	120.6	5.32	189.5	110.6	5.97
90.0	60.1	5.11	117.7	127.8	5.37	182.3	117.8	5.98
86.7	63.4	5.09	124.9	135.0	5.36	175.1	125.0	5.97
83.3	66.8	5.05	132.1	142.2	5.30	167.9	132.2	6.01
80.0	70.1	5.03	139.2	149.3	5.34	160.8	139.3	5.99
76.7	73.4	5.00	146.4	156.5	5.40	153.6	146.5	6.02
73.3	76.8	5.01	153.6	163.7	5.53	146.4	153.7	6.09
70.0	80.1	5.06	160.8	170.9	5.69	139.2	160.9	6.14
66.7	83.4	5.07	167.9	178.0	5.89	132.1	168.0	6.10
63.3	86.8	5.08	175.1	185.2	6.00	124.9	175.2	6.01
60.0	90.1	5.12	182.3	192.4	5.99	117.7	182.4	5.94
56.7	93.4	5.12	189.5	199.6	5.98	110.5	189.6	5.94
53.3	96.8	5.10	196.7	206.8	6.01	103.3	196.8	5.97
50.0	100.1	5.10	203.8	213.9	6.11	96.2	203.9	5.97
46.7	103.4	5.08	211.0	221.1	6.10	89.0	211.1	6.00
43.3	106.8	5.07	218.2	228.3	6.06	81.8	218.3	6.06
40.0	110.1	5.09	225.4	235.5	5.99	74.6	225.5	6.14
36.7	113.4	5.11	232.6	242.7	6.05	67.4	232.7	6.18
33.3	116.8	5.15	239.7	249.8	6.01	60.3	239.8	6.21
30.0	120.1	5.17	246.9	257.0	6.13	53.1	247.0	6.23
26.7	123.4	5.21	254.1	264.2	6.23	45.9	254.2	6.35
23.3	126.8	5.23	261.3	271.4	6.48	38.7	261.4	6.50
20.0	130.1	5.25	268.5	278.6	6.42	31.5	268.6	6.66
16.7	133.4	5.27	275.6	285.7	6.47	24.4	275.7	6.74
13.3	136.8	5.25	282.8	292.9	6.26	17.2	282.9	6.77
10.0	140.1	5.29	290.0	300.1	6.26	10.0	290.1	6.80

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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
0.1	63.69	65.01	66.59	58.11	59.81	61.05
1.0	61.00	61.51	62.33	54.94	56.17	57.68
2.0	61.43	62.05	62.47	54.78	56.05	57.65
10.0	63.25	64.41	64.74	54.73	56.12	57.68
22.7	76.09	77.69	78.64	60.48	57.58	55.91
35.2	71.82	73.49	75.46	56.93	56.01	54.70
47.8	68.97	70.56	72.90	54.65	53.91	53.57
60.4	66.83	68.35	69.89	51.72	51.56	52.19
72.9	64.79	66.96	69.08	48.71	49.56	50.73
85.5	64.48	65.78	66.70	46.60	47.84	49.05
98.0	62.50	66.41	70.25	44.96	46.67	47.80
110.6	59.98	61.25	63.19	43.82	45.52	46.88
123.2	60.58	62.43	64.08	42.62	44.62	46.05
135.7	62.88	65.85	66.29	40.66	42.05	43.63
148.3	60.56	63.52	64.31	40.87	41.71	42.70
160.9	55.82	59.57	61.68	41.06	42.32	42.73
173.4	52.89	55.34	58.53	40.99	42.96	44.25
186.0	51.33	53.27	55.07	39.31	40.78	42.29
198.6	49.51	51.71	54.20	37.88	39.52	40.86
211.1	49.33	52.26	55.00	37.60	39.45	40.56
236.3	49.89	50.87	51.58	37.38	38.91	38.24
248.8	52.64	52.63	56.00	39.52	38.93	36.84
261.4	53.57	57.89	52.28	40.45	39.65	36.62
273.9	52.70	53.94	50.51	38.81	38.86	37.02
286.5	50.59	51.28	51.15	35.76	35.40	35.45
299.1	47.92	47.02	44.89	34.11	33.93	34.05
311.6	47.24	45.46	43.53	33.73	33.44	33.25
336.8	48.61	46.61	43.41	34.02	33.14	32.23
349.3	47.09	43.95	41.16	34.27	32.92	31.69
361.9	47.40	44.21	41.52	34.94	32.93	30.98
374.5	49.09	45.53	39.44	35.42	33.53	29.35
387.0	45.99	41.39	34.86	34.95	34.10	26.89
399.6	45.46	40.91	33.97	32.75	32.89	25.00
412.2	43.18	40.07	33.19	29.74	30.41	23.35
437.3	34.84	34.66	29.91	24.48	26.11	21.38
449.8	32.05	32.98	28.94	22.48	24.52	20.59
462.4	29.39	30.98	27.87	20.78	23.20	20.25
475.0	27.21	28.76	26.25	19.41	21.85	19.58
487.5	25.66	27.21	25.57	18.28	20.21	18.80
500.1	24.45	25.41	24.54	17.81	18.89	18.06

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+14	+17	+20
10.1	40.1	36.96	37.44	37.20
22.7	52.7	32.23	32.64	33.09
35.2	65.2	28.89	29.46	29.70
47.8	77.8	27.10	27.47	27.81
60.4	90.4	25.50	26.13	26.50
72.9	102.9	24.37	24.74	25.02
85.5	115.5	23.89	24.50	24.85
98.0	128.0	23.16	23.87	24.47
110.6	140.6	22.64	23.42	23.92
123.2	153.2	22.13	23.05	23.61
135.7	165.7	21.46	22.27	23.04
148.3	178.3	21.61	22.18	22.81
160.9	190.9	21.96	22.53	22.84
173.4	203.4	22.20	22.87	23.31
186.0	216.0	22.53	23.46	23.98
198.6	228.6	21.49	22.65	23.40
211.1	241.1	20.22	21.74	22.71
223.7	253.7	18.77	20.12	20.80
236.3	266.3	17.73	18.65	19.48
248.8	278.8	16.99	17.60	18.25
261.4	291.4	16.45	16.80	17.13
273.9	303.9	16.23	16.45	16.77
286.5	316.5	15.84	15.92	16.15
299.1	329.1	15.78	15.81	15.96
311.6	341.6	15.59	15.61	15.74
324.2	354.2	15.72	15.75	15.98
336.8	366.8	15.76	15.80	16.18
349.3	379.3	15.62	15.73	16.14
361.9	391.9	15.96	16.07	16.20
374.5	404.5	15.65	15.62	15.51
387.0	417.0	15.55	15.28	14.79
399.6	429.6	15.35	14.68	13.98
412.2	442.2	14.51	13.52	12.94
424.7	454.7	13.87	12.74	12.21
437.3	467.3	12.93	11.79	11.25
449.8	479.8	12.08	11.00	10.59
462.4	492.4	11.28	10.16	9.84
475.0	505.0	10.59	9.37	9.06
487.5	517.5	9.94	8.75	8.49
500.1	530.1	9.26	8.13	7.80

Frequency Mixer

TAK-3H+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=300.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+14	+17	+20		+14	+17	+20		+14	+17	+20
5.0	35.0	1.90	1.63	1.53	5.0	1.20	1.53	2.48	5.0	1.70	1.54	1.61
10.0	40.0	1.91	1.64	1.55	10.0	1.15	1.52	2.46	10.0	1.72	1.54	1.62
22.7	52.7	1.80	1.57	1.44	22.7	1.20	1.43	2.15	17.4	3.58	3.21	2.87
35.2	65.2	1.77	1.57	1.43	35.2	1.20	1.46	2.24	24.9	3.23	2.92	2.60
47.8	77.8	1.76	1.55	1.41	47.8	1.19	1.45	2.20	32.3	3.10	2.82	2.51
60.4	90.4	1.76	1.53	1.39	60.4	1.15	1.42	2.12	39.7	2.92	2.67	2.37
72.9	102.9	1.72	1.51	1.38	72.9	1.13	1.40	2.06	47.2	2.88	2.66	2.36
85.5	115.5	1.69	1.44	1.32	85.5	1.13	1.40	2.04	54.6	2.92	2.69	2.39
98.0	128.0	1.63	1.44	1.29	98.0	1.14	1.42	2.08	62.1	2.95	2.73	2.42
110.6	140.6	1.59	1.40	1.30	110.6	1.13	1.45	2.14	69.5	2.97	2.76	2.46
123.2	153.2	1.58	1.38	1.29	123.2	1.11	1.49	2.20	76.9	3.02	2.81	2.52
135.7	165.7	1.61	1.39	1.26	135.7	1.08	1.51	2.23	84.4	3.04	2.83	2.57
148.3	178.3	1.54	1.40	1.27	148.3	1.08	1.52	2.20	91.8	3.09	2.87	2.61
160.9	190.9	1.44	1.32	1.25	160.9	1.10	1.53	2.18	99.2	3.12	2.89	2.64
173.4	203.4	1.36	1.25	1.21	173.4	1.08	1.55	2.19	106.7	3.18	2.94	2.69
186.0	216.0	1.33	1.23	1.21	186.0	1.07	1.58	2.24	114.1	3.18	2.95	2.71
198.6	228.6	1.33	1.24	1.25	198.6	1.09	1.62	2.31	121.5	3.17	2.95	2.72
211.1	241.1	1.39	1.29	1.33	211.1	1.15	1.67	2.37	129.0	3.11	2.91	2.69
223.7	253.7	1.49	1.33	1.38	223.7	1.21	1.70	2.39	136.4	3.06	2.89	2.67
236.3	266.3	1.56	1.37	1.39	236.3	1.27	1.73	2.38	143.8	3.04	2.86	2.65
248.8	278.8	1.62	1.46	1.40	248.8	1.31	1.77	2.38	151.3	3.02	2.85	2.64
261.4	291.4	1.61	1.48	1.42	261.4	1.31	1.83	2.43	158.7	2.99	2.83	2.63
273.9	303.9	1.58	1.49	1.43	273.9	1.33	1.89	2.52	166.2	2.98	2.82	2.64
286.5	316.5	1.54	1.47	1.43	286.5	1.36	1.95	2.62	173.6	2.96	2.80	2.64
299.1	329.1	1.51	1.44	1.39	299.1	1.40	2.02	2.72	181.0	2.99	2.82	2.67
311.6	341.6	1.52	1.45	1.40	311.6	1.44	2.07	2.78	188.5	3.01	2.84	2.68
324.2	354.2	1.43	1.35	1.27	324.2	1.47	2.10	2.81	195.9	3.04	2.86	2.70
336.8	366.8	1.44	1.35	1.20	336.8	1.51	2.12	2.82	203.3	3.01	2.84	2.69
349.3	379.3	1.37	1.24	1.07	349.3	1.54	2.14	2.83	210.8	2.95	2.78	2.63
361.9	391.9	1.41	1.23	1.13	361.9	1.58	2.18	2.87	218.2	2.86	2.69	2.55
374.5	404.5	1.35	1.18	1.16	374.5	1.63	2.24	2.93	225.6	2.80	2.62	2.47
387.0	417.0	1.39	1.28	1.31	387.0	1.70	2.30	2.99	233.1	2.78	2.61	2.44
399.6	429.6	1.46	1.36	1.39	399.6	1.76	2.34	3.01	240.5	2.79	2.61	2.44
412.2	442.2	1.53	1.51	1.55	412.2	1.82	2.37	3.00	247.9	2.76	2.59	2.42
424.7	454.7	1.66	1.62	1.66	424.7	1.87	2.37	2.99	255.4	2.73	2.56	2.39
437.3	467.3	1.72	1.72	1.77	437.3	1.93	2.39	2.98	262.8	2.72	2.54	2.38
449.8	479.8	1.92	1.91	1.95	449.8	2.02	2.45	3.00	270.3	2.76	2.56	2.39
462.4	492.4	2.00	1.96	2.02	462.4	2.12	2.51	3.05	277.7	2.81	2.60	2.41
475.0	505.0	2.21	2.09	2.14	475.0	2.23	2.58	3.10	285.1	2.84	2.61	2.42
487.5	517.5	2.37	2.11	2.14	487.5	2.36	2.65	3.14	292.6	2.80	2.58	2.39
500.1	530.1	2.54	2.19	2.18	500.1	2.48	2.71	3.17	300.0	2.74	2.53	2.37

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	18	28	20	39	28	42	29	42	39	52
1	-	16	+0	28	15	29	26	43	28	51	33	48
2	>100	70	53	61	51	65	63	65	56	75	52	60
3	>100	54	52	57	46	62	44	60	47	66	51	60
4	>100	77	67	79	69	84	67	76	73	84	72	83
5	>100	87	70	77	68	72	65	76	66	80	89	>93
6	>100	>93	89	92	86	>93	51	90	83	93	85	>93
7	>100	>93	89	93	84	85	82	81	>93	93	92	>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: 150.1 MHz; -1.00 dBm.
 LO IN: 180.01 MHz; +17.00 dBm
 IF OUT: 29.91 MHz; -6.59 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	28	41	31	49	41	58	42	64	50	71
1	-	17	+0	29	14	33	30	46	36	54	43	56
2	80	52	64	56	56	52	63	80	60	64	53	60
3	>100	41	36	44	57	47	47	45	41	56	43	56
4	>100	78	62	66	63	68	71	69	63	75	67	73
5	>100	68	62	63	50	69	44	60	45	64	53	67
6	>100	88	76	80	74	81	55	78	72	73	73	83
7	>100	69	71	70	61	83	61	66	54	69	56	76
8	>100	>103	83	96	82	79	75	82	78	85	74	77
9	>100	83	80	91	86	82	67	72	66	70	64	70
10	>100	85	84	92	86	93	81	89	91	96	82	96
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 150.1 MHz; 9.00 dBm.
 LO IN: 180.01 MHz; +17.00 dBm
 IF OUT: 29.91 MHz; 3.48 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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