

# Frequency Mixers

LEVEL 7 (+7 dBm LO, up to +1 dBm RF)

Models

TUF-1  
TUF-1SM

T-74-09-01



computer-automated performance data  
 typical production unit / for data of other models consult factory

## mixer conversion loss and isolation

RF MHz	LO MHz	Conversion Loss (dB)			Isolation L-R (dB)			Isolation L-I (dB)		
		LO + 4 dBm	LO + 7 dBm	LO + 10 dBm	LO + 4 dBm	LO + 7 dBm	LO + 10 dBm	LO + 4 dBm	LO + 7 dBm	LO + 10 dBm
2.000	32.000	7.09	6.81	6.58	87.30	81.85	77.21	68.80	72.15	73.61
4.000	34.000	6.68	6.40	6.19	78.00	76.35	73.81	66.70	68.25	68.21
5.000	35.000	6.62	6.34	6.12	75.70	74.35	72.61	65.80	66.65	66.71
10.000	40.000	6.54	6.25	6.02	69.63	69.58	68.44	62.53	62.18	61.74
20.000	50.000	6.46	6.21	5.98	64.30	64.25	64.03	58.40	57.65	56.43
50.000	80.000	6.36	6.13	5.95	57.56	57.73	57.67	52.41	50.60	49.26
81.733	51.733	6.44	6.16	5.95	53.47	53.89	54.19	48.78	46.89	45.69
100.000	70.000	6.48	6.18	5.96	51.89	52.31	52.63	47.30	45.35	44.00
161.467	131.467	6.34	6.08	5.91	48.63	49.28	49.54	43.72	42.03	40.89
200.000	170.000	6.15	6.03	5.89	47.02	47.46	47.65	41.84	40.24	39.02
241.200	211.200	6.17	6.04	5.90	46.01	46.41	46.63	40.25	38.76	37.49
281.067	251.067	6.18	6.04	5.90	44.63	45.16	45.38	38.53	37.18	36.02
300.000	270.000	6.35	6.09	5.92	44.31	44.55	44.64	38.08	36.84	35.72
320.933	290.933	6.31	6.08	5.92	43.71	44.04	43.87	37.13	35.94	34.79
400.667	370.667	6.18	5.99	5.86	42.32	42.93	42.99	33.91	33.45	32.72
480.400	450.400	6.28	6.06	5.90	40.18	40.46	40.80	31.33	30.91	30.51
500.000	470.000	6.33	6.11	5.95	39.89	40.16	40.42	31.07	30.63	30.27
560.133	530.133	6.35	6.15	5.99	39.63	39.99	40.02	29.59	29.30	28.68
580.067	550.067	6.41	6.19	6.02	39.64	40.02	40.17	29.36	29.24	28.71
600.000	570.000	6.45	6.26	6.10	39.55	39.76	39.73	28.83	28.69	28.09

## mixer VSWR

ϕ detection

FREQ. (MHz)	VSWR RF port			VSWR LO port			VSWR IF port			FREQ. (MHz)	max DC output mV	DC offset mV
	LO + 4 dBm	LO + 7 dBm	LO + 10 dBm	LO + 4 dBm	LO + 7 dBm	LO + 10 dBm	LO + 4 dBm	LO + 7 dBm	LO + 10 dBm			
2.000	1.53	1.56	1.58	1.90	2.71	3.80	1.34	1.19	1.09	2.000	-230.82	-0.05
4.000	1.28	1.31	1.34	1.82	2.64	3.73	1.34	1.19	1.10	4.000	-231.66	-0.01
5.000	1.22	1.25	1.29	1.81	2.62	3.70	1.34	1.19	1.09	5.000	-230.98	-0.07
10.000	1.10	1.15	1.20	1.67	2.47	3.54	1.35	1.19	1.10	10.000	-230.48	0.02
20.000	1.04	1.11	1.17	1.71	2.51	3.57	1.35	1.19	1.10	20.000	-225.17	0.02
50.000	1.02	1.10	1.16	1.67	2.46	3.50	1.36	1.20	1.12	50.000	-238.30	0.02
100.000	1.09	1.13	1.17	1.64	2.41	3.42	1.39	1.24	1.16	81.733	-244.03	-0.01
109.640	1.11	1.14	1.18	1.62	2.37	3.36	1.39	1.25	1.17	100.000	-251.23	0.04
169.440	1.19	1.20	1.24	1.61	2.31	3.24	1.44	1.31	1.24	161.467	-233.45	0.06
217.280	1.25	1.27	1.29	1.60	2.29	3.19	1.49	1.36	1.30	200.000	-234.93	0.03
265.120	1.32	1.33	1.36	1.61	2.26	3.14	1.55	1.43	1.37	241.200	-250.57	0.14
300.000	1.38	1.38	1.40	1.63	2.28	3.16	1.63	1.52	1.46	281.067	-248.51	0.07
324.920	1.41	1.42	1.44	1.65	2.30	3.17	1.62	1.48	1.42	300.000	-239.16	0.10
372.760	1.49	1.50	1.51	1.68	2.31	3.19	1.71	1.57	1.51	320.933	-239.97	0.14
420.600	1.58	1.58	1.59	1.71	2.32	3.16	1.80	1.66	1.59	400.667	-252.65	0.37
468.440	1.66	1.66	1.67	1.78	2.33	3.12	1.89	1.74	1.68	480.400	-232.77	0.59
500.000	1.72	1.71	1.72	1.79	2.33	3.11	1.95	1.80	1.73	500.000	-226.52	0.58
540.200	1.79	1.77	1.78	1.84	2.35	3.10	2.03	1.88	1.80	560.133	-225.65	0.94
588.040	1.88	1.86	1.86	1.86	2.36	3.12	2.12	1.97	1.89	580.067	-227.84	0.87
600.000	1.90	1.88	1.88	1.88	2.38	3.14	2.14	1.99	1.91	600.000	-231.92	0.89



2 to 600 MHz



**mixer harmonic intermodulation**  
(relative to desired IF output)

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RF ORDER HARMONIC	RF CAL											
0	-	-	4	22	13	36	36	34	23	38	57	41
1	-	21	+0	27	12	30	19	39	44	36	37	36
2	96	66	51	61	50	70	49	60	62	> 74	59	59
3	> 96	> 75	> 75	> 75	> 75	75	67	> 75	71	> 74	> 74	71
4	95	74	> 75	> 75	72	74	> 76	74	74	> 75	> 75	> 74
5	> 95	> 74	73	> 75	> 76	> 75	> 75	> 75	> 75	> 75	> 74	74
6	> 96	> 74	> 53	> 74	72	> 75	> 75	75	> 75	75	> 75	> 75
7	> 96	> 75	73	> 74	> 75	> 75	74	> 76	> 75	> 75	74	> 76
8	> 96	> 75	> 74	72	> 74	> 75	> 75	> 75	75	75	> 76	> 76
9	> 95	74	> 75	> 74	> 74	> 74	> 74	> 74	> 75	> 75	74	> 75
10	95	> 76	> 75	> 75	> 75	73	> 74	73	> 75	> 75	> 76	> 75
	0	1	2	3	4	5	6	7	8	9	10	

Harmonic LO Order

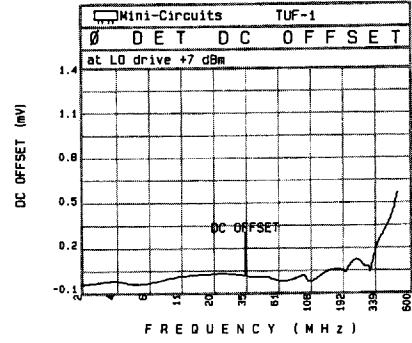
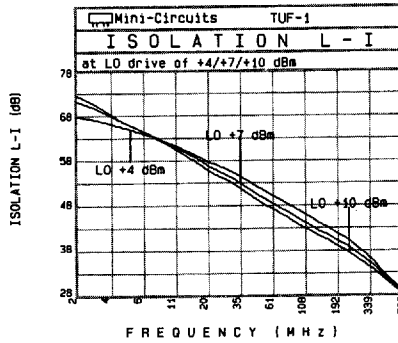
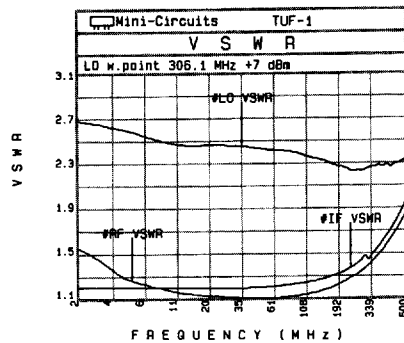
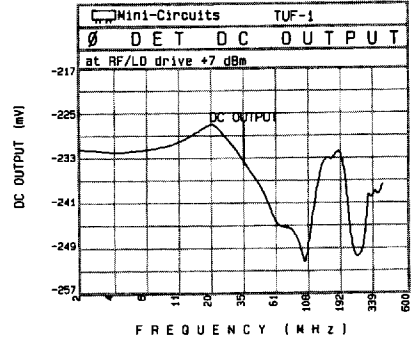
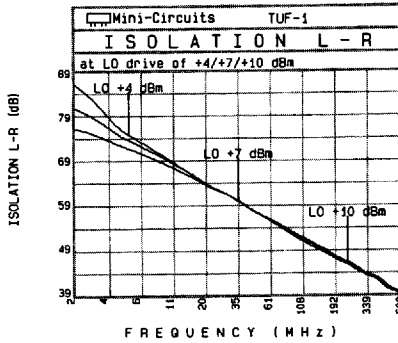
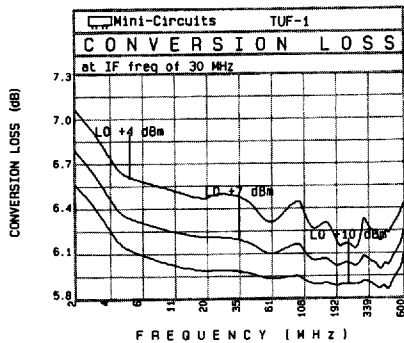
RF ORDER HARMONIC	RF CAL											
0	-	-	13	34	26	54	48	43	36	60	65	58
1	-	16	+0	28	11	31	25	42	44	40	42	40
2	95	61	40	52	41	58	41	59	54	66	51	56
3	95	55	49	50	45	52	47	58	50	56	62	53
4	> 96	73	62	62	59	64	57	74	60	68	65	80
5	> 95	79	76	67	65	63	64	67	60	72	59	75
6	> 95	84	73	83	75	77	76	81	73	75	72	83
7	> 95	> 84	> 84	84	84	82	79	> 85	> 85	82	84	84
8	> 97	> 85	> 85	> 84	> 84	> 85	> 85	> 85	> 85	84	> 85	82
9	> 96	> 84	> 84	> 84	> 84	80	> 84	> 85	> 85	82	> 86	84
10	> 96	84	82	82	83	> 85	> 84	> 82	> 85	82	> 85	85
	0	1	2	3	4	5	6	7	8	9	10	

Harmonic LO Order

test condition: RF IN: 490.10 MHz; -14.94 DBM  
LO IN: 460.01 MHz; +7.01 DBM  
IF OUT: 30.09 MHz; -20.78 DBM

test condition: RF IN: 490.10 MHz; -5.03 DBM  
LO IN: 460.01 MHz; +7.01 DBM  
IF OUT: 30.09 MHz; -10.93 DBM

**typical performance curves**  
(production unit)



**In Stock...Immediate Delivery**