Non-Catalog Model

Frequency Mixer TFM-2LH

Level 10 (LO Power +10 dBm)

Important Note

This is a non-catalog model and can be manufactured on specific request.
Pricing and delivery information can be supplied upon request.

Please click "Back", and then click "Contact Us" for Applications support.

CASE STYLE : B02

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		**Min.**	**Typ.**	**Max.**	**Units**
Frequency	**LO** (fL to fU)	2		1000	MHz
	RF (fL to fU)	2		1000	MHz
	IF	0		1000	MHz
Conversion Loss	**mid band**		5.7	7.5	dB
	Total Range			9.2	dB
LO-RF Isolation	**Low Range**	45	62		dB
	Mid Range	25	44		dB
	Upper Range	25	37		dB
LO-IF Isolation	**Low Range**	40	58		dB
	Mid Range	25	45		dB
	Upper Range	18	31		dB
1 dB Comp. Input Power			+5		dBm

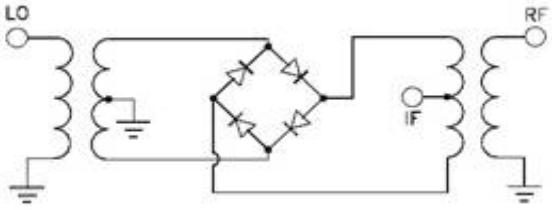
Notes: Low Range = [fL to 10fL] Mid Range = [10fL to fU/2] Upper Range = [fU/2 to fU]
mid band = [2fL to fU/2]

Hermetically sealed

MAXIMUM RATINGS	
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

PIN CONNECTIONS	
LO	4
RF	1
IF	2
GROUND	3

Electrical Schematics



Frequency Mixer TFM-2LH

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+7	+10	+13
10.1	40.1	5.92	5.74	5.62
50.3	80.3	6.36	5.99	5.84
90.5	120.5	6.38	6.09	5.93
130.8	160.8	6.38	6.06	5.90
171.0	201.0	6.31	6.06	5.97
211.2	241.2	6.36	6.10	5.97
251.4	281.4	6.42	6.16	6.02
291.7	321.7	6.35	6.13	6.02
331.9	361.9	6.41	6.18	6.05
372.1	402.1	6.41	6.18	6.05
412.3	442.3	6.47	6.23	6.08
452.6	482.6	6.49	6.26	6.11
492.8	522.8	6.55	6.27	6.08
533.0	563.0	6.60	6.29	6.12
573.2	603.2	6.67	6.39	6.19
613.5	643.5	6.74	6.49	6.30
653.7	683.7	6.87	6.61	6.42
693.9	723.9	6.98	6.68	6.44
734.1	764.1	7.00	6.64	6.42
794.5	824.5	7.07	6.65	6.43
834.7	864.7	7.20	6.70	6.44
895.0	925.0	7.86	7.00	6.60
935.3	965.3	8.24	7.28	6.68
995.6	1025.6	8.75	7.84	7.03
1035.8	1065.8	9.01	8.17	7.34
1096.2	1126.2	9.16	8.36	7.58
1136.4	1166.4	9.18	8.31	7.49
1196.7	1226.7	9.18	8.16	7.37
1237.0	1267.0	8.91	7.91	7.37
1297.3	1327.3	8.87	8.18	7.82
1337.5	1367.5	8.94	8.46	8.16
1397.9	1427.9	9.21	8.88	8.68
1438.1	1468.1	9.33	9.06	8.88
1498.4	1528.4	9.57	9.32	9.12
1538.6	1568.6	9.74	9.56	9.40
1599.0	1629.0	10.03	9.84	9.69
1639.2	1669.2	10.33	10.16	10.02
1699.5	1729.5	10.56	10.38	10.26
1739.8	1769.8	10.96	10.75	10.65
1800.1	1830.1	11.23	10.94	10.87

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+7	+10	+13
10.1	40.1	21.72	24.14	27.19
50.3	80.3	21.53	22.53	21.69
90.5	120.5	19.50	18.76	26.66
130.8	160.8	17.09	21.23	22.63
171.0	201.0	20.99	22.55	20.48
211.2	241.2	22.08	19.13	18.87
251.4	281.4	19.25	16.98	17.80
291.7	321.7	17.54	17.56	18.71
331.9	361.9	15.36	15.59	17.03
372.1	402.1	14.67	16.32	17.94
412.3	442.3	13.09	14.01	16.65
452.6	482.6	14.87	15.33	17.05
492.8	522.8	17.37	19.42	22.37
533.0	563.0	15.24	19.20	23.48
573.2	603.2	12.91	14.63	19.16
613.5	643.5	12.38	12.83	14.72
653.7	683.7	12.72	13.61	15.10
693.9	723.9	12.81	14.43	16.94
734.1	764.1	13.03	15.79	19.66
794.5	824.5	14.07	18.99	22.29
834.7	864.7	12.53	17.34	22.24
895.0	925.0	7.61	14.46	19.62
935.3	965.3	6.27	10.58	18.24
995.6	1025.6	5.93	8.29	12.69
1035.8	1065.8	6.77	8.30	12.12
1096.2	1126.2	6.96	8.55	10.92
1136.4	1166.4	6.28	7.81	10.36
1196.7	1226.7	6.15	8.94	12.16
1237.0	1267.0	7.57	11.45	13.72
1297.3	1327.3	10.88	13.51	14.84
1337.5	1367.5	12.62	14.17	14.80
1397.9	1427.9	14.20	15.27	15.60
1438.1	1468.1	14.46	15.92	17.18
1498.4	1528.4	15.03	16.17	19.42
1538.6	1568.6	16.61	15.64	17.72
1599.0	1629.0	21.34	18.93	17.11
1639.2	1669.2	18.82	24.92	19.46
1699.5	1729.5	19.10	20.91	24.87
1739.8	1769.8	19.13	18.73	21.52
1800.1	1830.1	21.25	19.73	21.33

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+5dBm (dB) @LO (dBm)		
		+7	+10	+13
10.1	40.1	-18.81	-18.58	-14.66
50.3	80.3	-19.03	-12.50	-5.85
90.5	120.5	-12.77	-7.00	-1.28
130.8	160.8	-10.35	-4.11	1.45
171.0	201.0	-5.34	0.38	4.05
211.2	241.2	-5.47	0.43	4.04
251.4	281.4	-2.07	2.71	4.32
291.7	321.7	-2.18	2.63	4.09
331.9	361.9	-1.27	3.01	3.46
372.1	402.1	-0.01	3.46	3.33
412.3	442.3	-0.67	3.10	2.94
452.6	482.6	0.68	3.29	2.49
492.8	522.8	0.07	3.08	2.39
533.0	563.0	0.75	3.06	2.25
573.2	603.2	0.49	2.96	2.11
613.5	643.5	0.27	2.67	1.97
653.7	683.7	0.71	2.51	1.83
693.9	723.9	0.27	2.18	1.89
734.1	764.1	0.75	2.05	1.86
794.5	824.5	0.81	1.84	1.88
834.7	864.7	1.17	1.70	1.69
895.0	925.0	0.97	1.26	1.22
935.3	965.3	1.10	1.19	1.19
995.6	1025.6	0.79	0.85	0.89
1035.8	1065.8	0.57	0.67	0.75
1096.2	1126.2	0.56	0.60	0.75
1136.4	1166.4	0.58	0.66	0.90
1196.7	1226.7	0.55	0.82	1.22
1237.0	1267.0	0.62	1.07	1.37
1297.3	1327.3	0.64	1.21	1.15
1337.5	1367.5	0.78	1.08	0.98
1397.9	1427.9	0.82	0.70	0.59
1438.1	1468.1	0.75	0.56	0.44
1498.4	1528.4	0.52	0.37	0.27
1538.6	1568.6	0.48	0.28	0.20
1599.0	1629.0	0.31	0.18	0.13
1639.2	1669.2	0.27	0.14	0.10
1699.5	1729.5	0.19	0.11	0.07
1739.8	1769.8	0.13	0.07	0.05
1800.1	1830.1	0.17	0.07	0.03

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=510.1MHz (dB) @LO (dBm) +10
500.0	10.1	6.30
487.4	22.7	6.23
474.9	35.2	6.12
462.3	47.8	6.13
449.7	60.4	6.23
437.2	72.9	6.13
424.6	85.5	6.08
412.1	98.0	6.08
399.5	110.6	6.00
386.9	123.2	5.97
374.4	135.7	5.98
361.8	148.3	5.98
349.2	160.9	5.95
336.7	173.4	5.99
324.1	186.0	5.99
311.5	198.6	5.99
299.0	211.1	6.02
286.4	223.7	6.02
273.8	236.3	5.99
261.3	248.8	6.06
248.7	261.4	6.09
236.2	273.9	6.05
223.6	286.5	6.10
211.0	299.1	6.15
198.5	311.6	6.08
185.9	324.2	6.08
173.3	336.8	6.12
160.8	349.3	6.11
148.2	361.9	6.16
135.6	374.5	6.21
123.1	387.0	6.18
110.5	399.6	6.21
97.9	412.2	6.24
85.4	424.7	6.18
72.8	437.3	6.20
60.3	449.8	6.29
47.7	462.4	6.26
35.1	475.0	6.28
22.6	487.5	6.35
10.0	500.1	6.40

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) @LO (dBm) +10
10.0	20.1	5.97
70.6	80.7	5.87
131.2	141.3	5.92
191.7	201.8	5.91
252.3	262.4	5.91
312.9	323.0	6.05
373.5	383.6	6.05
434.1	444.2	6.16
494.7	504.8	6.21
555.2	565.3	6.19
615.8	625.9	6.26
676.4	686.5	6.38
716.8	726.9	6.39
777.4	787.5	6.01
817.8	827.9	6.23
878.3	888.4	5.96
918.7	928.8	5.86
979.3	989.4	6.19
1019.7	1029.8	6.23
1080.3	1090.4	6.30
1120.7	1130.8	6.31
1181.3	1191.4	6.14
1221.7	1231.8	6.11
1282.2	1292.3	6.07
1322.6	1332.7	6.06
1383.2	1393.3	6.39
1423.6	1433.7	6.37
1484.2	1494.3	6.84
1524.6	1534.7	7.01
1585.1	1595.2	7.35
1625.5	1635.6	7.46
1686.1	1696.2	8.17
1726.5	1736.6	8.27
1787.1	1797.2	8.90
1827.5	1837.6	9.20
1888.1	1898.2	9.69
1928.4	1938.5	10.09
1989.0	1999.1	10.63
2029.4	2039.5	10.96
2090.0	2100.1	11.29

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1010.1MHz (dB) @LO (dBm) +10
1000.0	10.1	7.27
979.8	30.3	7.24
959.6	50.5	7.21
939.4	70.7	7.21
919.2	90.9	7.14
899.0	111.1	7.04
878.8	131.3	7.04
858.6	151.5	7.03
838.4	171.7	7.06
818.2	191.9	7.03
798.0	212.1	7.06
777.8	232.3	7.08
757.6	252.5	7.00
737.3	272.8	7.15
717.1	293.0	7.12
696.9	313.2	7.15
676.7	333.4	7.11
656.5	353.6	7.12
636.3	373.8	7.12
616.1	394.0	7.11
575.7	434.4	7.13
555.5	454.6	7.18
515.1	495.0	7.23
494.9	515.2	7.18
454.5	555.6	7.07
434.3	575.8	7.06
393.9	616.2	7.14
373.7	636.4	7.18
333.3	676.8	7.26
313.1	697.0	7.29
272.7	737.4	7.08
252.4	757.7	6.95
212.0	798.1	6.75
191.8	818.3	6.69
151.4	858.7	6.74
131.2	878.9	6.79
90.8	919.3	6.92
70.6	939.5	7.10
30.2	979.9	7.48
10.0	1000.1	7.76

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+7	+10	+13	+7	+10	+13
40.1	60.60	61.06	60.98	59.84	57.94	56.71
80.3	56.14	56.61	57.01	55.21	53.47	51.87
120.5	53.21	53.77	54.33	51.99	50.02	49.12
160.8	50.77	51.68	52.20	49.67	48.32	47.17
201.0	49.08	49.91	50.54	48.11	46.80	45.59
241.2	47.76	48.66	49.16	46.77	45.62	44.28
281.4	46.38	47.36	48.01	44.86	44.02	42.96
321.7	45.42	46.26	46.81	42.76	42.36	41.69
361.9	44.72	45.63	46.40	41.04	40.94	40.65
402.1	44.17	45.23	45.86	39.09	39.54	39.47
442.3	42.89	43.88	44.72	37.18	37.60	37.88
482.6	41.94	42.82	43.57	35.81	36.38	36.71
522.8	41.27	42.11	42.93	34.62	35.52	36.06
563.0	41.43	42.37	43.13	33.69	34.49	35.18
603.2	41.76	42.82	43.47	33.08	33.84	34.49
643.5	42.18	43.10	43.68	32.50	33.25	33.69
683.7	42.13	42.85	43.24	31.68	32.55	33.00
723.9	42.17	42.68	42.89	30.83	31.97	32.58
764.1	41.72	42.15	42.34	29.75	31.06	31.75
824.5	40.55	40.99	41.14	28.32	29.62	30.57
864.7	39.50	40.32	40.65	26.96	28.35	29.46
925.0	38.43	39.50	40.18	25.71	26.84	28.14
965.3	37.54	38.70	39.41	24.95	25.87	27.09
1025.6	36.73	38.08	39.19	24.77	25.56	26.44
1065.8	36.41	37.74	38.94	24.24	25.15	25.97
1126.2	35.71	37.11	38.15	23.91	25.05	26.00
1166.4	35.39	36.65	37.72	23.41	24.51	25.49
1226.7	33.04	34.46	35.55	23.46	24.55	25.47
1267.0	33.58	35.03	36.08	22.75	23.56	24.57
1327.3	33.87	35.31	36.38	21.96	22.91	24.00
1367.5	33.99	35.31	36.20	21.60	22.57	23.54
1427.9	34.00	35.20	36.03	21.81	22.69	23.57
1468.1	34.14	35.21	35.70	21.92	22.70	23.23
1528.4	34.04	34.86	35.38	22.51	22.99	23.47
1568.6	33.94	34.58	34.72	22.72	23.04	23.06
1629.0	33.78	34.04	33.80	23.67	23.52	23.21
1669.2	33.65	33.66	33.27	24.02	23.52	22.88
1729.5	33.58	33.36	32.96	24.81	23.79	22.89
1769.8	33.20	32.85	32.18	25.24	23.87	22.63
1830.1	32.74	32.18	31.56	26.22	24.28	22.82

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+7	+10	+13
10.1	40.1	52.97	53.01	51.67
50.3	80.3	39.12	39.18	39.05
90.5	120.5	34.48	34.05	34.62
130.8	160.8	31.80	31.81	32.20
171.0	201.0	30.54	30.40	30.82
211.2	241.2	29.32	29.55	29.60
251.4	281.4	28.58	28.82	28.97
291.7	321.7	28.22	28.32	28.63
331.9	361.9	28.11	28.51	28.83
372.1	402.1	28.13	28.47	28.71
412.3	442.3	28.19	28.69	28.98
452.6	482.6	28.03	28.49	28.58
492.8	522.8	27.54	28.04	28.43
533.0	563.0	27.10	27.74	28.34
573.2	603.2	26.08	26.47	27.20
613.5	643.5	24.53	24.78	25.10
653.7	683.7	23.33	23.25	23.29
693.9	723.9	21.87	21.86	21.68
734.1	764.1	20.52	20.27	20.03
794.5	824.5	19.21	18.95	18.73
834.7	864.7	18.75	18.44	18.31
895.0	925.0	18.37	18.06	17.95
935.3	965.3	18.21	17.87	17.65
995.6	1025.6	18.23	17.91	17.59
1035.8	1065.8	18.16	18.00	17.65
1096.2	1126.2	18.18	18.02	17.83
1136.4	1166.4	17.88	17.72	17.43
1196.7	1226.7	17.22	17.03	16.74
1237.0	1267.0	17.24	16.83	16.61
1297.3	1327.3	15.73	15.43	15.25
1337.5	1367.5	14.85	14.48	14.26
1397.9	1427.9	13.45	13.15	12.97
1438.1	1468.1	12.70	12.43	12.24
1498.4	1528.4	11.60	11.28	11.04
1538.6	1568.6	11.04	10.64	10.45
1599.0	1629.0	10.34	9.96	9.71
1639.2	1669.2	9.98	9.59	9.35
1699.5	1729.5	9.47	9.09	8.80
1739.8	1769.8	9.13	8.78	8.55
1800.1	1830.1	8.81	8.50	8.31

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+7	+10	+13
10.1	40.1	1.06	1.10	1.17
50.3	80.3	1.04	1.03	1.08
90.5	120.5	1.03	1.05	1.11
130.8	160.8	1.04	1.06	1.12
171.0	201.0	1.02	1.09	1.15
211.2	241.2	1.03	1.09	1.15
251.4	281.4	1.02	1.09	1.15
291.7	321.7	1.05	1.12	1.17
331.9	361.9	1.04	1.11	1.15
372.1	402.1	1.06	1.13	1.19
412.3	442.3	1.04	1.11	1.16
452.6	482.6	1.06	1.12	1.17
492.8	522.8	1.06	1.12	1.18
533.0	563.0	1.06	1.14	1.20
573.2	603.2	1.09	1.16	1.22
613.5	643.5	1.07	1.13	1.18
653.7	683.7	1.09	1.15	1.20
693.9	723.9	1.05	1.11	1.15
734.1	764.1	1.08	1.14	1.17
794.5	824.5	1.02	1.04	1.08
834.7	864.7	1.03	1.06	1.10
895.0	925.0	1.18	1.12	1.12
935.3	965.3	1.23	1.19	1.19
995.6	1025.6	1.40	1.33	1.29
1035.8	1065.8	1.50	1.45	1.42
1096.2	1126.2	1.62	1.56	1.52
1136.4	1166.4	1.81	1.76	1.72
1196.7	1226.7	1.86	1.80	1.75
1237.0	1267.0	2.09	2.03	1.99
1297.3	1327.3	2.10	2.07	2.03
1337.5	1367.5	2.45	2.42	2.38
1397.9	1427.9	2.41	2.40	2.39
1438.1	1468.1	2.67	2.66	2.64
1498.4	1528.4	2.63	2.63	2.62
1538.6	1568.6	2.82	2.83	2.82
1599.0	1629.0	2.81	2.82	2.83
1639.2	1669.2	2.87	2.87	2.87
1699.5	1729.5	3.03	3.04	3.04
1739.8	1769.8	3.04	3.03	3.02
1800.1	1830.1	3.26	3.24	3.24

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+7	+10	+13
40.1	1.67	2.49	3.50
80.3	1.56	2.24	3.08
120.5	1.62	2.35	3.26
160.8	1.59	2.30	3.17
201.0	1.55	2.24	3.09
241.2	1.60	2.33	3.21
281.4	1.57	2.24	3.07
321.7	1.60	2.32	3.18
361.9	1.59	2.27	3.10
402.1	1.61	2.29	3.12
442.3	1.64	2.33	3.16
482.6	1.62	2.28	3.09
522.8	1.67	2.35	3.16
563.0	1.68	2.33	3.12
603.2	1.71	2.38	3.18
643.5	1.73	2.39	3.17
683.7	1.73	2.37	3.15
723.9	1.75	2.38	3.15
764.1	1.76	2.36	3.12
824.5	1.85	2.45	3.19
864.7	1.90	2.48	3.20
925.0	1.98	2.58	3.28
965.3	1.99	2.60	3.30
1025.6	2.01	2.63	3.34
1065.8	2.01	2.62	3.33
1126.2	2.00	2.59	3.28
1166.4	2.00	2.57	3.25
1226.7	1.96	2.51	3.20
1267.0	1.95	2.52	3.22
1327.3	1.96	2.54	3.25
1367.5	2.01	2.60	3.31
1427.9	2.12	2.67	3.36
1468.1	2.23	2.77	3.42
1528.4	2.41	2.88	3.51
1568.6	2.57	3.00	3.60
1629.0	2.78	3.17	3.75
1669.2	2.98	3.31	3.85
1729.5	3.25	3.48	3.99
1769.8	3.49	3.64	4.09
1830.1	3.84	3.85	4.23

IF (OUT) (MHz)	IF VSWR @LO=1000MHz (:1) @LO (dBm)		
	+7	+10	+13
10.0	2.48	2.01	1.68
30.0	2.51	2.03	1.69
50.0	2.55	2.06	1.73
70.0	2.47	2.00	1.67
90.0	2.52	2.04	1.70
110.0	2.43	1.97	1.64
130.0	2.57	2.08	1.75
150.0	2.49	2.02	1.70
170.0	2.54	2.06	1.73
190.0	2.45	1.99	1.67
210.0	2.50	2.04	1.71
230.0	2.51	2.04	1.72
250.0	2.54	2.07	1.75
270.0	2.48	2.03	1.71
290.0	2.49	2.04	1.72
310.0	2.52	2.06	1.74
330.0	2.50	2.05	1.74
350.0	2.56	2.10	1.78
370.0	2.45	2.00	1.70
390.0	2.54	2.08	1.77
430.0	2.54	2.09	1.78
450.0	2.45	2.02	1.72
490.0	2.42	1.99	1.70
510.0	2.47	2.04	1.74
550.0	2.43	2.01	1.72
570.0	2.40	1.97	1.69
610.0	2.45	2.02	1.72
630.0	2.34	1.93	1.66
670.0	2.27	1.88	1.61
690.0	2.36	1.94	1.66
730.0	2.31	1.91	1.64
750.0	2.22	1.82	1.56
790.0	2.20	1.81	1.54
810.0	2.18	1.81	1.55
850.0	2.10	1.74	1.49
870.0	2.13	1.76	1.49
910.0	2.11	1.76	1.49
930.0	2.00	1.66	1.41
970.0	1.94	1.62	1.37
990.0	2.01	1.69	1.44

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	9	24	12	29	15	33	17	49	32	47
1	-	22	+0	34	11	40	22	40	44	35	36	43
2	84	66	48	63	49	66	49	63	55	70	53	64
3	>90	67	65	69	62	70	59	69	68	>74	68	>74
4	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
5	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
6	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
7	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
8	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
9	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
10	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500 MHz; -10.00 dBm.
LO IN: 530 MHz; +10.00 dBm
IF OUT: 30 MHz; -16.36 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	19	34	23	42	26	44	31	57	51	64
1	-	23	+0	31	12	40	23	44	42	41	46	51
2	65	67	41	60	41	61	43	53	48	57	44	71
3	>90	51	42	54	51	61	41	78	52	56	56	49
4	>90	73	63	68	58	66	59	70	55	71	67	70
5	>90	66	67	64	52	64	51	61	50	59	58	72
6	>90	>84	>84	>84	71	>84	67	77	64	76	66	78
7	>90	>84	>84	>84	74	>84	75	>84	77	>84	69	81
8	>90	>84	>84	>84	>84	>84	81	>84	76	>84	74	>84
9	>90	>84	>84	>84	>84	>84	79	>84	76	>84	78	83
10	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500 MHz; 0.00 dBm.
LO IN: 530 MHz; +10.00 dBm
IF OUT: 30 MHz; -6.31 dBm

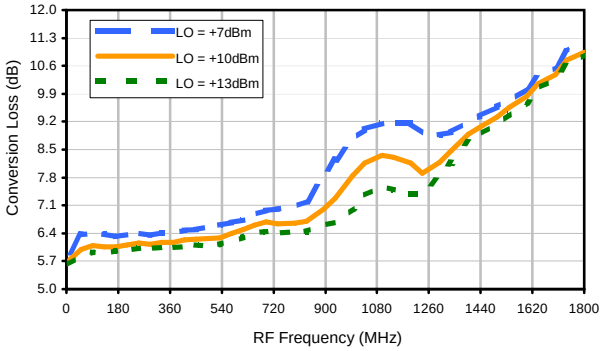
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

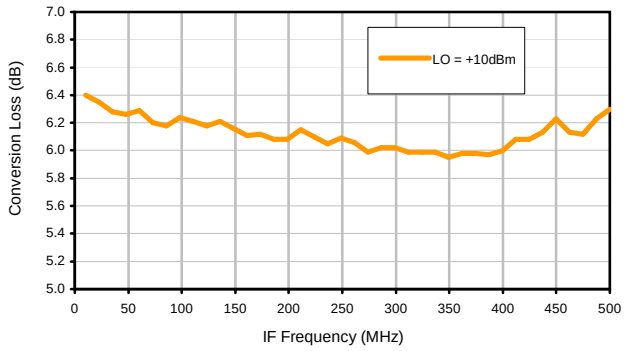
Frequency Mixer TFM-2LH

Typical Performance Curves

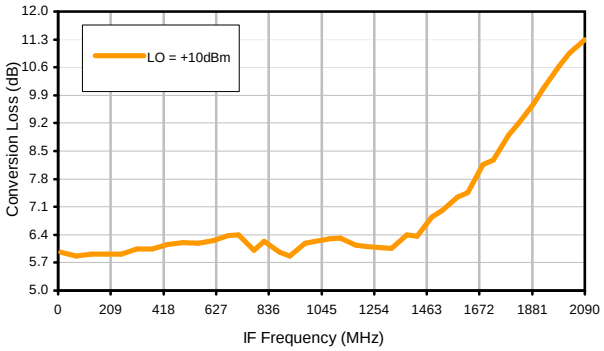
Conversion Loss @ IF=30MHz



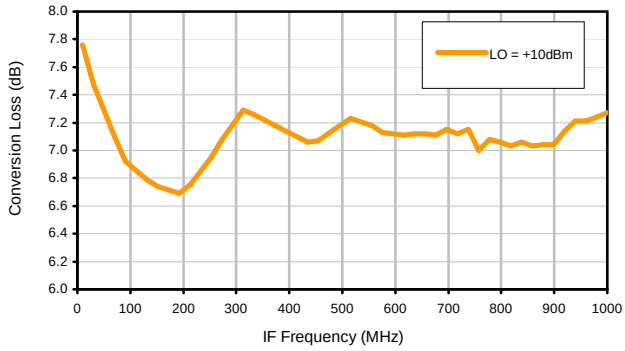
Conversion Loss vs. IF @ RF=510.1MHz



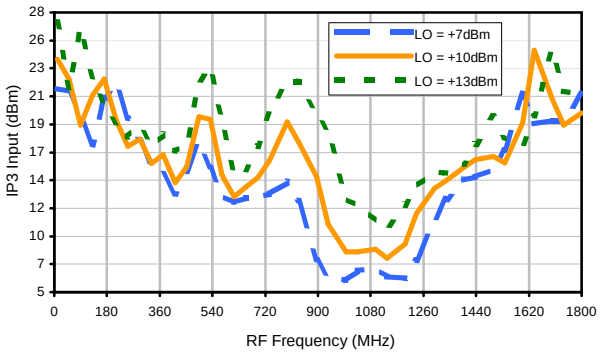
Conversion Loss vs. IF @ RF=10.1MHz



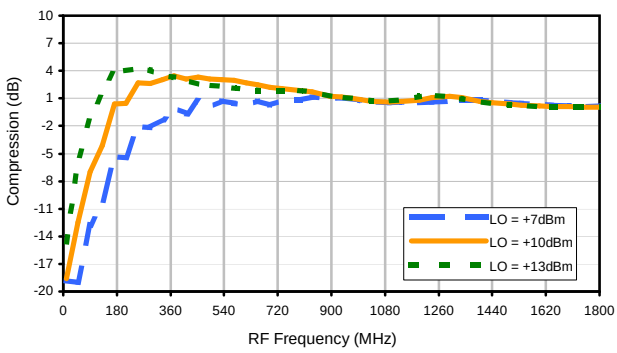
Conversion Loss vs. IF @ RF=1010.1MHz



IP3 Input



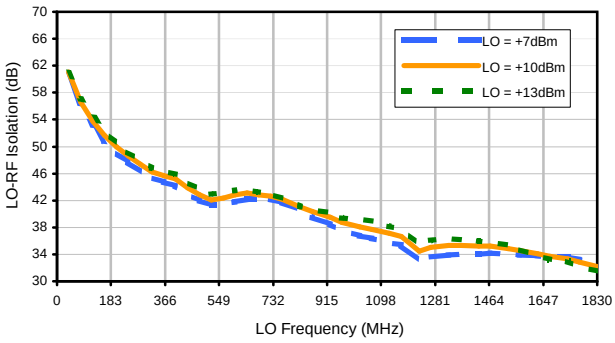
Compression @ RF IN=+5dBm



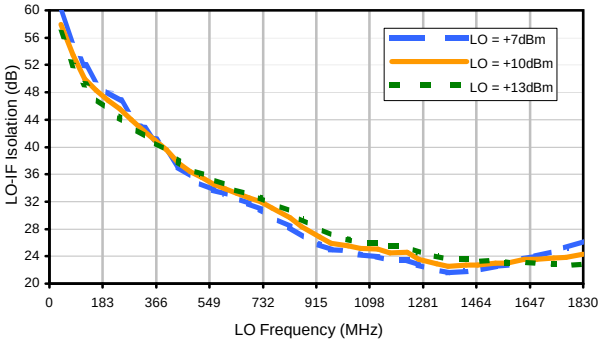
Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Curves

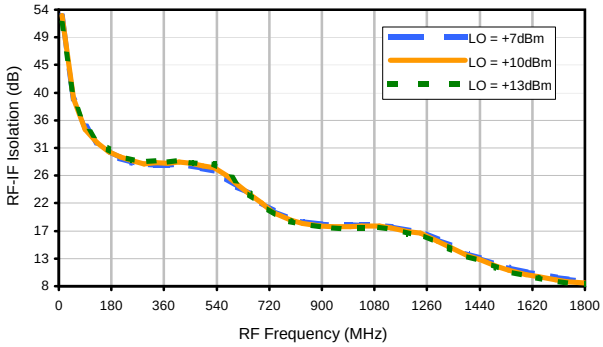
LO-RF Isolation



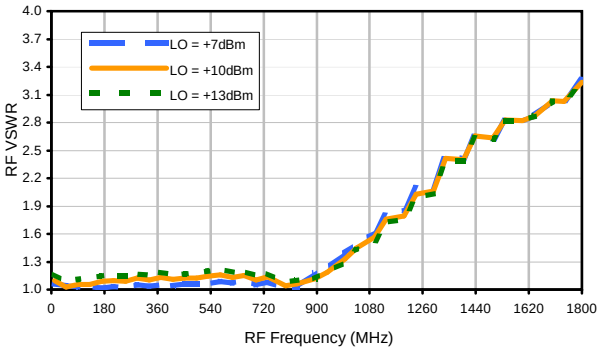
LO-IF Isolation



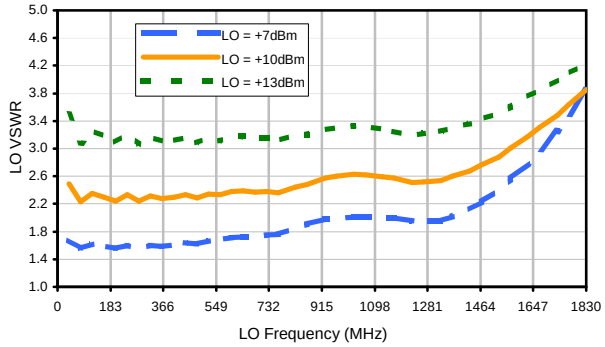
RF-IF Isolation



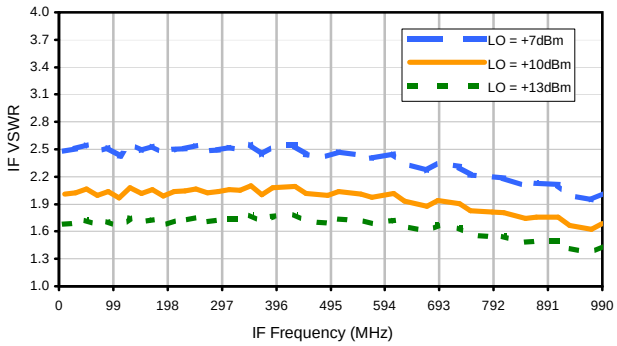
RF VSWR



LO VSWR



IF VSWR



Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	9	24	12	29	15	33	17	49	32	47
1	-	22	+0	34	11	40	22	40	44	35	36	43
2	84	66	48	63	49	66	49	63	55	70	53	64
3	>90	67	65	69	62	70	59	69	68	>74	68	>74
4	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
5	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
6	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
7	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
8	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
9	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
10	>90	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74	>74
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500 MHz; -10.00 dBm.
LO IN: 530 MHz; +10.00 dBm
IF OUT: 30 MHz; -16.36 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	19	34	23	42	26	44	31	57	51	64
1	-	23	+0	31	12	40	23	44	42	41	46	51
2	65	67	41	60	41	61	43	53	48	57	44	71
3	>90	51	42	54	51	61	41	78	52	56	56	49
4	>90	73	63	68	58	66	59	70	55	71	67	70
5	>90	66	67	64	52	64	51	61	50	59	58	72
6	>90	>84	>84	>84	71	>84	67	77	64	76	66	78
7	>90	>84	>84	>84	74	>84	75	>84	77	>84	69	81
8	>90	>84	>84	>84	>84	>84	81	>84	76	>84	74	>84
9	>90	>84	>84	>84	>84	>84	79	>84	76	>84	78	83
10	>90	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84	>84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: RF IN: 500 MHz; 0.00 dBm.
LO IN: 530 MHz; +10.00 dBm
IF OUT: 30 MHz; -6.31 dBm

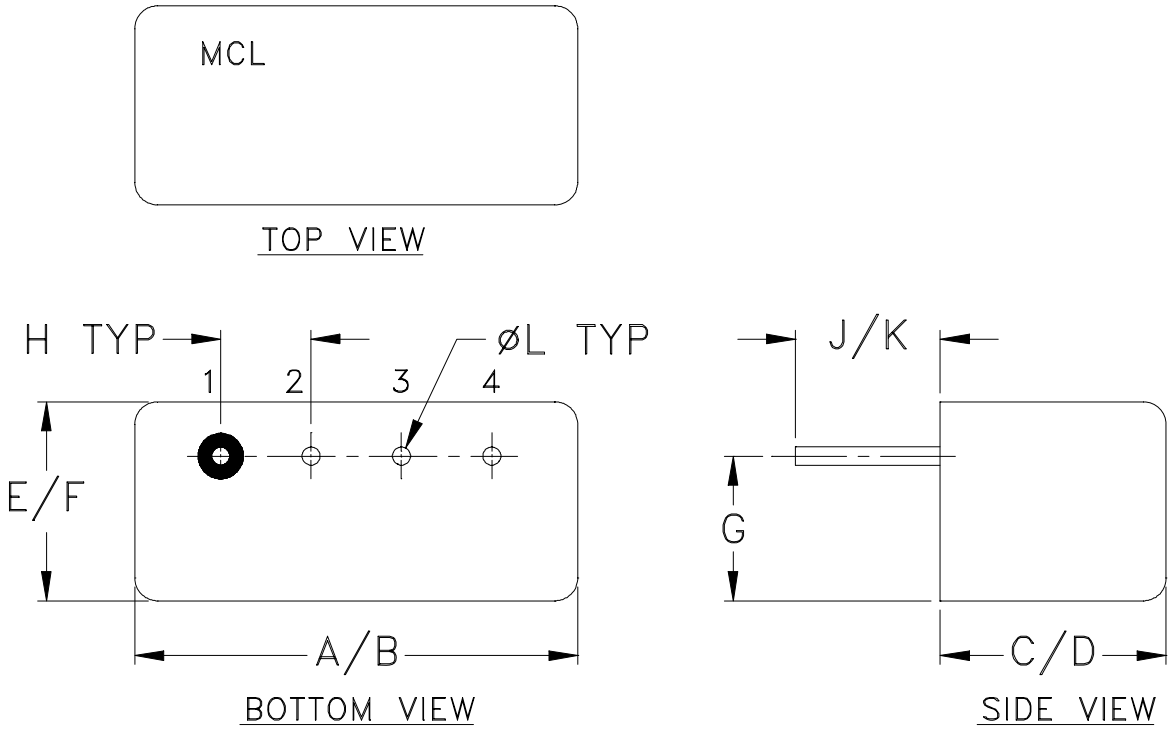
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Mini-Circuits®
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Case Style B

B02
B13

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	WT, GRAM
B02	.480 (12.19)	.500 (12.70)	.240 (6.10)	.255 (6.48)	.210 (5.33)	.230 (5.84)	.16 (4.06)	.100 (2.54)	.14 (3.56)	.20 (5.08)	.020 (.51)	1.9
B13			.390 (9.91)	.405 (10.29)								2.3

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3 Pl. ± .015

Notes:

1. Header material: C.R.S.
   Pin material: #52 alloy.
   Cover material: Cupro-Nickel.
2. Pin finish: Electro Tin-Silver.
3. Tolerance on pin diameter +/-.005 inch.
4. Glass meniscus 0.015 inch max.
5. Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

This document and its contents are the property of Mini-Circuits

Mini-Circuits

Environmental Specifications ENV01

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Moisture Resistance	10 cycles, 24 hours per cycle	MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours
Solderability	10X Magnification	J-STD-002, 95% Coverage
Resistance to Solder Heat	260°C for 10 seconds	MIL-STD-202, Method 210, Condition B
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215
Terminal Strength	4 1/2 Pound Pull	MIL-STD-202, Method 211, Condition A

This document and its contents are the property of Mini-Circuits.

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Gross Leak	125°C Bubble Test	MIL-STD-202, Method 112, Condition D
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D

This document and its contents are the property of Mini-Circuits.