Coaxial

Frequency Mixer

ZX05-1L-S+

Level 3 (LO Power +3 dBm) 2 to 500 MHz

Generic photo used for illustration purposes only

CASE STYLE: FL905

Connectors	Model
SMA	ZX05-1L-S+

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

Permanent damage may occur if any of these limits are exceeded.

Coaxial Connections

LO	1
RF	2
IF	3

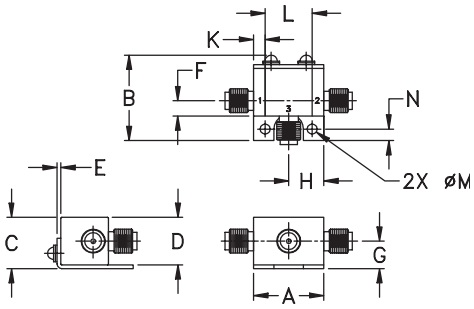
Features

- rugged construction
- small size
- low conversion loss
- high L-R isolation
- protected by US Patents 6,133,525 & 6,790,049

Applications

- cellular
- PCS
- instrumentation
- satellite communication

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.74	.90	.54	.50	.04	.16	.29
18.80	22.86	13.72	12.70	1.02	4.06	7.37

H	J	K	L	M	N	wt
.37	--	.122	.496	.106	.122	grams
9.40	--	3.10	12.60	2.69	3.10	20.0

Electrical Specifications (T_{AMB}=25°C)

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
		Mid-Band m			Total Range	L		M		U		L		M		U		
LO/RF f_L-f_U	IF	$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
2-500	DC-500	5.2	0.1	7.2	8.0	68	50	55	30	44	30	55	40	45	30	35	25	16

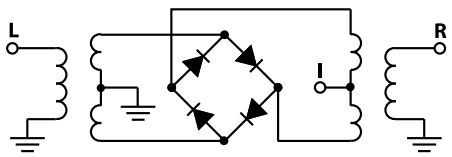
1 dB COMP.: 0 dBm typ.

L = low range [f_L to 10 f_L] M = mid range [10 f_L to f_U/2] U = upper range [f_U/2 to f_U]
m= mid band [2f_L to f_U/2]

Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +3dBm	LO +3dBm	LO +3dBm	LO +3dBm	LO +3dBm
2.10	32.10	6.13	73.59	76.66	1.27	1.63
20.10	50.10	5.57	69.92	58.59	1.14	1.54
50.10	80.10	5.64	63.85	50.98	1.13	1.54
70.10	40.10	5.66	60.54	48.03	1.13	1.52
94.10	64.10	5.70	57.76	45.29	1.13	1.52
106.10	76.10	5.68	56.42	44.32	1.12	1.52
142.10	112.10	5.64	53.59	41.90	1.12	1.52
166.10	136.10	5.66	52.14	40.76	1.12	1.54
190.10	160.10	5.62	50.86	39.83	1.12	1.55
214.10	184.10	5.61	49.33	38.88	1.11	1.57
238.10	208.10	5.61	48.62	37.96	1.12	1.59
270.10	240.10	5.67	47.30	37.31	1.13	1.61
300.77	270.77	5.68	45.64	36.86	1.14	1.64
331.43	301.43	5.72	44.35	36.25	1.15	1.67
362.10	332.10	5.71	43.39	35.39	1.17	1.68
392.77	362.77	5.79	44.69	34.15	1.19	1.75
423.43	393.43	5.77	44.08	33.62	1.22	1.79
454.10	424.10	5.84	44.03	32.86	1.23	1.77
484.77	454.77	5.90	43.22	31.69	1.24	1.83
500.10	470.10	5.95	42.81	31.23	1.24	1.85

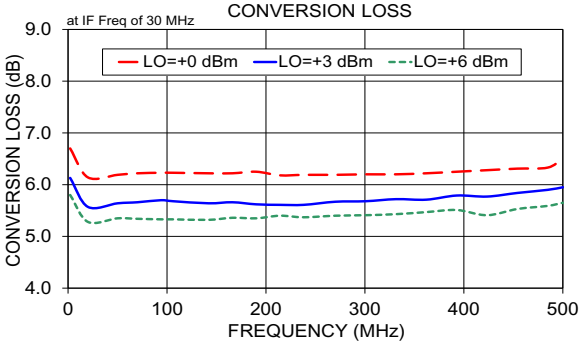
Electrical Schematic



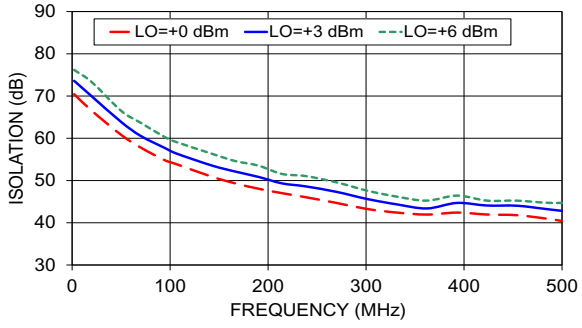
Notes

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

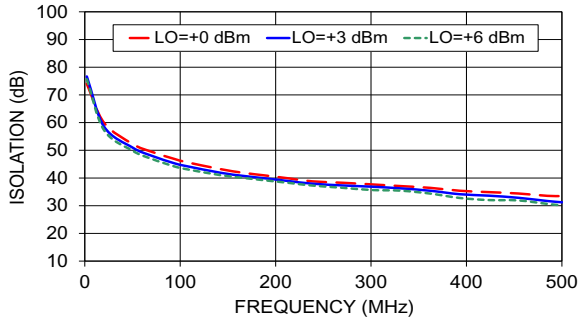
ZX05-1L-S+
CONVERSION LOSS
at IF Freq of 30 MHz



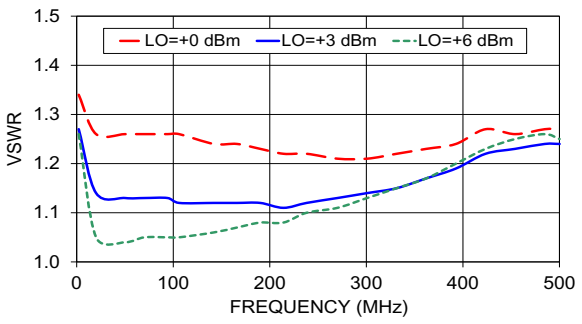
ZX05-1L-S+
L-R ISOLATION



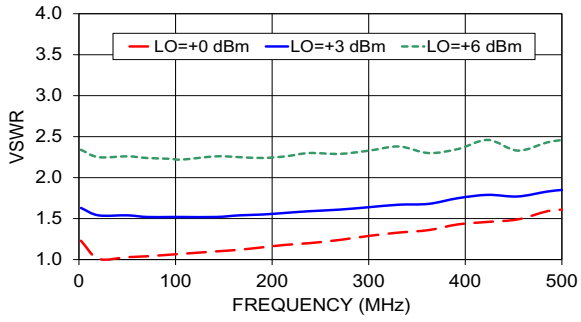
ZX05-1L-S+
L-I ISOLATION



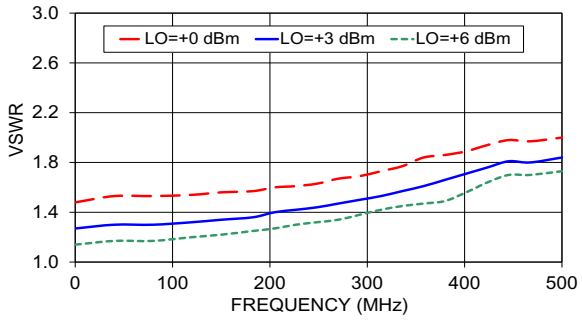
ZX05-1L-S+
RF VSWR



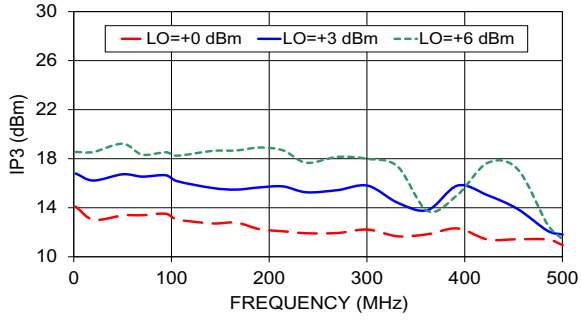
ZX05-1L-S+
LO VSWR



ZX05-1L-S+
IF VSWR



ZX05-1L-S+
IP3



Frequency Mixer ZX05-1L+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		0	+3	+6
2.0	32.0	6.28	5.88	5.48
5.0	35.0	5.74	5.44	5.14
10.0	40.0	5.62	5.32	4.92
50.4	80.4	6.82	6.00	5.62
90.8	120.8	6.82	6.02	5.64
110.9	140.9	6.79	6.00	5.62
151.3	181.3	6.76	5.99	5.65
171.5	201.5	6.70	5.98	5.66
211.8	241.8	6.68	6.00	5.68
232.0	262.0	6.66	6.01	5.71
272.3	302.3	6.69	6.06	5.73
292.5	322.5	6.69	6.04	5.73
332.8	362.8	6.74	6.09	5.78
353.0	383.0	6.76	6.15	5.81
393.3	423.3	6.80	6.21	5.84
453.8	483.8	6.88	6.29	5.97
474.0	504.0	6.91	6.27	5.98
514.3	544.3	7.02	6.32	5.98
534.5	564.5	7.07	6.36	6.00
574.8	604.8	7.32	6.54	6.04
595.0	625.0	7.46	6.69	6.13
635.4	665.4	7.77	7.07	6.44
655.5	685.5	7.91	7.22	6.58
695.9	725.9	8.26	7.54	6.93
756.4	786.4	8.70	7.94	7.36
776.5	806.5	8.87	8.11	7.53
816.9	846.9	8.99	8.26	7.69
837.0	867.0	9.06	8.31	7.75
877.4	907.4	9.14	8.36	7.79
897.6	927.6	9.11	8.31	7.73
937.9	967.9	9.24	8.35	7.73
958.1	988.1	9.39	8.39	7.75
998.4	1028.4	9.47	8.39	7.76
1018.6	1048.6	9.59	8.42	7.84
1058.9	1088.9	9.88	8.63	8.08
1079.1	1109.1	9.90	8.72	8.23
1119.4	1149.4	10.34	9.10	8.61
1139.6	1169.6	10.79	9.37	8.85
1179.9	1209.9	11.41	9.84	9.34
1200.1	1230.1	11.67	10.07	9.56

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		0	+3	+6
10.1	40.1	25.46	20.71	26.68
50.4	80.4	20.07	21.62	18.40
90.8	120.8	24.82	21.06	20.06
110.9	140.9	21.44	21.23	27.99
151.3	181.3	30.54	24.17	26.06
171.5	201.5	21.78	18.56	20.59
211.8	241.8	21.01	23.19	20.97
232.0	262.0	18.26	17.17	18.99
272.3	302.3	37.25	19.10	23.66
292.5	322.5	19.48	15.80	14.82
332.8	362.8	29.38	15.64	14.61
353.0	383.0	18.46	21.54	15.73
393.3	423.3	19.56	16.83	15.87
413.5	443.5	21.99	16.37	16.25
453.8	483.8	16.11	13.51	12.69
474.0	504.0	17.91	13.10	11.57
514.3	544.3	13.20	13.67	12.57
534.5	564.5	11.42	13.27	13.43
574.8	604.8	7.92	11.15	14.18
595.0	625.0	6.64	9.15	14.05
635.4	665.4	4.50	5.62	9.50
655.5	685.5	3.79	4.48	7.19
695.9	725.9	3.68	4.08	5.64
716.0	746.0	3.95	4.44	5.70
756.4	786.4	4.54	5.19	6.33
776.5	806.5	4.95	5.48	6.61
816.9	846.9	6.17	6.79	8.02
837.0	867.0	6.88	8.12	9.59
877.4	907.4	8.77	9.97	12.72
897.6	927.6	10.17	10.59	14.01
937.9	967.9	12.01	12.44	14.89
958.1	988.1	11.93	14.49	17.78
998.4	1028.4	12.16	13.51	16.27
1018.6	1048.6	11.73	13.27	14.23
1058.9	1088.9	10.95	12.09	13.62
1079.1	1109.1	10.58	11.55	12.99
1119.4	1149.4	9.65	11.34	11.13
1139.6	1169.6	8.95	10.07	10.79
1179.9	1209.9	8.48	9.53	10.22
1200.1	1230.1	8.51	9.17	11.05

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=0dBm (dB) @LO (dBm)		
		0	+3	+6
10.1	40.1	1.34	0.82	0.56
50.4	80.4	1.35	0.78	0.48
90.8	120.8	1.34	0.78	0.51
110.9	140.9	1.35	0.81	0.51
151.3	181.3	1.29	0.78	0.48
171.5	201.5	1.29	0.78	0.47
211.8	241.8	1.27	0.70	0.44
232.0	262.0	1.31	0.73	0.45
272.3	302.3	1.26	0.72	0.47
292.5	322.5	1.23	0.67	0.46
332.8	362.8	1.23	0.65	0.42
353.0	383.0	1.21	0.66	0.43
393.3	423.3	1.21	0.65	0.46
413.5	443.5	1.27	0.69	0.46
453.8	483.8	1.33	0.75	0.50
474.0	504.0	1.39	0.81	0.51
514.3	544.3	1.39	0.89	0.54
534.5	564.5	1.42	0.92	0.58
574.8	604.8	1.49	1.08	0.70
595.0	625.0	1.51	1.08	0.77
635.4	665.4	1.55	1.17	0.97
655.5	685.5	1.55	1.12	0.98
695.9	725.9	1.42	1.04	0.84
716.0	746.0	1.36	0.99	0.83
756.4	786.4	1.22	0.92	0.74
776.5	806.5	1.20	0.86	0.66
816.9	846.9	1.28	0.89	0.72
837.0	867.0	1.22	0.85	0.69
877.4	907.4	1.32	0.92	0.73
897.6	927.6	1.34	0.96	0.76
937.9	967.9	1.39	1.07	0.81
958.1	988.1	1.45	1.11	0.80
998.4	1028.4	1.50	1.20	0.85
1018.6	1048.6	1.45	1.14	0.83
1058.9	1088.9	1.53	1.11	0.76
1079.1	1109.1	1.51	1.08	0.68
1119.4	1149.4	1.42	1.00	0.64
1139.6	1169.6	1.43	1.08	0.65
1179.9	1209.9	1.37	1.00	0.62
1200.1	1230.1	1.28	0.97	0.57

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (dB) @LO (dBm) +3
240.0	10.1	5.99
234.1	16.0	6.00
228.2	21.9	5.99
222.3	27.8	5.98
216.4	33.7	5.97
210.5	39.6	5.94
204.6	45.5	5.94
198.7	51.4	5.91
192.8	57.3	5.90
186.9	63.2	5.89
181.0	69.1	5.88
175.1	75.0	5.89
169.2	80.9	5.85
163.3	86.8	5.85
157.4	92.7	5.86
151.5	98.6	5.84
145.6	104.5	5.83
139.7	110.4	5.82
133.8	116.3	5.81
127.9	122.2	5.80
122.1	128.0	5.79
116.2	133.9	5.77
110.3	139.8	5.76
104.4	145.7	5.75
98.5	151.6	5.78
92.6	157.5	5.78
86.7	163.4	5.77
80.8	169.3	5.78
74.9	175.2	5.74
69.0	181.1	5.76
63.1	187.0	5.77
57.2	192.9	5.73
51.3	198.8	5.78
45.4	204.7	5.77
39.5	210.6	5.78
33.6	216.5	5.78
27.7	222.4	5.81
21.8	228.3	5.79
15.9	234.2	5.87
10.0	240.1	6.09

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) @LO (dBm) +3
20.2	10.1	5.79
32.2	22.1	5.55
44.2	34.1	5.53
56.2	46.1	5.48
68.2	58.1	5.47
80.2	70.1	5.49
92.2	82.1	5.48
104.2	94.1	5.52
116.2	106.1	5.49
128.2	118.1	5.56
140.2	130.1	5.54
152.2	142.1	5.51
164.2	154.1	5.54
176.2	166.1	5.53
188.2	178.1	5.56
200.2	190.1	5.54
212.2	202.1	5.56
224.2	214.1	5.60
236.2	226.1	5.55
248.2	238.1	5.61
260.2	250.1	5.63
272.2	262.1	5.62
284.2	274.1	5.62
296.2	286.1	5.68
308.2	298.1	5.68
320.2	310.1	5.70
332.2	322.1	5.70
344.2	334.1	5.74
356.2	346.1	5.73
368.2	358.1	5.73
380.2	370.1	5.71
392.2	382.1	5.72
404.2	394.1	5.80
416.2	406.1	6.16
428.2	418.1	6.24
440.2	430.1	5.94
452.2	442.1	5.92
464.2	454.1	5.89
488.2	478.1	5.91
500.2	490.1	6.01

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB) @LO (dBm) +3
490.0	10.1	6.38
478.0	22.1	6.36
466.0	34.1	6.33
454.0	46.1	6.32
442.0	58.1	6.30
430.0	70.1	6.32
418.0	82.1	6.26
406.0	94.1	6.18
394.0	106.1	6.14
382.0	118.1	6.13
370.0	130.1	6.09
358.0	142.1	6.09
346.0	154.1	6.08
334.0	166.1	6.07
322.0	178.1	6.05
310.0	190.1	6.04
298.0	202.1	6.03
286.0	214.1	6.01
274.0	226.1	6.00
262.0	238.1	6.02
250.0	250.1	5.62
238.0	262.1	5.99
226.0	274.1	5.98
214.0	286.1	6.06
202.0	298.1	6.07
190.0	310.1	6.09
178.0	322.1	6.10
166.0	334.1	6.12
154.0	346.1	6.14
142.0	358.1	6.18
130.0	370.1	6.17
118.0	382.1	6.20
106.0	394.1	6.19
94.0	406.1	6.17
82.0	418.1	6.18
70.0	430.1	6.27
58.0	442.1	6.25
46.0	454.1	6.23
22.0	478.1	6.36
10.0	490.1	6.28

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	0	+3	+6	0	+3	+6
2.0	67.0	68.8	68.2	57.6	57.2	55.8
5.0	67.1	68.3	70.0	56.4	56.4	54.9
10.0	65.5	68.0	68.9	55.2	55.4	53.8
50.4	59.47	63.85	68.78	58.55	56.83	55.58
90.8	54.77	58.66	63.27	53.39	51.80	50.80
110.9	53.17	56.70	60.67	51.53	50.16	49.34
151.3	49.81	53.15	57.34	48.78	47.54	46.76
171.5	48.94	52.21	56.31	47.62	46.56	45.80
211.8	47.23	50.27	54.06	45.78	44.89	44.37
232.0	46.10	49.19	52.80	44.96	44.26	43.62
272.3	44.29	47.35	50.62	43.60	42.93	42.21
292.5	43.26	46.27	49.37	43.40	42.87	42.08
332.8	41.98	44.50	47.25	42.40	41.81	40.79
353.0	41.17	43.44	45.83	42.12	41.45	40.27
393.3	40.25	42.15	43.94	41.13	40.42	39.68
453.8	39.00	40.89	42.37	40.34	38.05	36.46
474.0	38.72	40.40	41.61	40.78	37.97	35.92
514.3	38.45	40.10	41.01	42.12	38.10	35.29
534.5	38.05	39.76	40.61	42.91	38.40	35.16
574.8	36.80	38.74	39.74	42.09	38.52	34.74
595.0	36.17	38.19	39.26	40.62	37.98	34.26
635.4	34.59	36.52	37.64	36.75	35.17	33.03
655.5	34.34	36.18	37.22	35.41	33.69	32.10
695.9	32.95	34.65	35.64	33.48	31.35	29.93
756.4	30.89	32.40	33.42	31.87	29.61	27.84
776.5	30.46	31.96	32.96	31.40	29.11	27.25
816.9	29.60	31.15	32.21	30.15	28.19	26.34
837.0	29.42	30.90	31.89	29.52	27.74	25.91
877.4	28.96	30.36	31.28	28.43	27.20	25.44
897.6	28.46	29.90	30.84	27.62	26.82	25.14
937.9	28.17	29.42	30.10	26.12	26.10	24.48
958.1	27.81	28.96	29.46	25.18	25.53	23.92
998.4	27.89	28.78	28.86	23.27	24.32	22.85
1018.6	27.66	28.27	28.06	22.33	23.46	22.03
1058.9	27.75	27.77	27.09	20.60	22.05	21.02
1079.1	27.63	27.46	26.58	19.50	21.13	20.54
1119.4	27.63	26.72	25.41	17.82	19.47	19.37
1139.6	27.77	26.50	24.98	17.04	18.72	18.86
1179.9	27.85	25.98	24.14	15.54	17.19	17.83
1200.1	27.54	25.51	23.63	14.93	16.55	17.27

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		0	+3	+6
10.1	40.1	45.79	52.75	40.38
50.4	80.4	32.33	32.38	32.57
90.8	120.8	27.80	27.99	28.12
110.9	140.9	26.39	26.63	26.76
151.3	181.3	24.27	24.53	24.70
171.5	201.5	23.52	23.80	24.00
211.8	241.8	22.47	22.81	22.99
232.0	262.0	22.08	22.47	22.68
272.3	302.3	21.63	22.08	22.43
292.5	322.5	21.54	22.01	22.37
332.8	362.8	21.59	22.10	22.41
353.0	383.0	21.74	22.28	22.60
393.3	423.3	22.13	22.90	23.34
413.5	443.5	22.19	23.07	23.61
453.8	483.8	22.21	23.27	23.99
474.0	504.0	21.90	22.93	23.55
514.3	544.3	20.76	21.49	21.87
534.5	564.5	20.14	20.62	20.90
574.8	604.8	18.93	19.07	19.12
595.0	625.0	18.45	18.44	18.39
635.4	665.4	17.67	17.52	17.36
655.5	685.5	17.39	17.22	17.05
695.9	725.9	17.06	16.84	16.68
716.0	746.0	16.99	16.73	16.55
756.4	786.4	16.88	16.60	16.35
776.5	806.5	16.89	16.61	16.36
816.9	846.9	16.59	16.39	16.18
837.0	867.0	16.35	16.20	16.00
877.4	907.4	15.68	15.64	15.46
897.6	927.6	15.25	15.23	15.07
937.9	967.9	14.35	14.40	14.34
958.1	988.1	13.85	13.94	13.96
998.4	1028.4	12.94	13.08	13.24
1018.6	1048.6	12.45	12.63	12.81
1058.9	1088.9	11.63	11.81	11.91
1079.1	1109.1	11.20	11.33	11.35
1119.4	1149.4	10.36	10.35	10.26
1139.6	1169.6	9.94	9.85	9.71
1179.9	1209.9	9.17	8.91	8.64
1200.1	1230.1	8.81	8.47	8.14

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		0	+3	+6
2.0	32.0	1.34	1.32	1.32
5.0	35.0	1.23	1.19	1.15
10.0	40.0	1.20	1.14	1.08
50.4	80.4	1.34	1.17	1.06
90.8	120.8	1.41	1.23	1.12
110.9	140.9	1.37	1.18	1.08
151.3	181.3	1.36	1.20	1.11
171.5	201.5	1.38	1.21	1.11
211.8	241.8	1.28	1.13	1.07
232.0	262.0	1.29	1.15	1.10
272.3	302.3	1.32	1.18	1.12
292.5	322.5	1.30	1.16	1.11
332.8	362.8	1.30	1.18	1.14
353.0	383.0	1.29	1.17	1.14
393.3	423.3	1.30	1.21	1.19
413.5	443.5	1.30	1.21	1.19
453.8	483.8	1.30	1.22	1.21
474.0	504.0	1.31	1.24	1.23
514.3	544.3	1.31	1.21	1.21
534.5	564.5	1.30	1.21	1.22
574.8	604.8	1.36	1.25	1.23
595.0	625.0	1.38	1.25	1.22
635.4	665.4	1.45	1.33	1.27
655.5	685.5	1.51	1.39	1.32
695.9	725.9	1.63	1.52	1.44
716.0	746.0	1.73	1.62	1.55
756.4	786.4	1.99	1.87	1.79
776.5	806.5	2.07	1.96	1.88
816.9	846.9	2.33	2.22	2.15
837.0	867.0	2.45	2.34	2.26
877.4	907.4	2.55	2.45	2.37
897.6	927.6	2.70	2.60	2.52
937.9	967.9	2.83	2.70	2.62
958.1	988.1	2.84	2.70	2.62
998.4	1028.4	3.05	2.90	2.82
1018.6	1048.6	3.12	2.95	2.86
1058.9	1088.9	3.14	2.95	2.87
1079.1	1109.1	3.21	3.03	2.95
1119.4	1149.4	3.26	3.04	2.95
1139.6	1169.6	3.34	3.08	2.97
1179.9	1209.9	3.43	3.10	2.96
1200.1	1230.1	3.38	3.03	2.89

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	0	+3	+6
2.0	1.15	1.67	2.68
5.0	1.16	1.66	2.68
10.0	1.16	1.66	2.68
50.4	1.11	1.42	2.13
90.8	1.11	1.42	2.10
110.9	1.12	1.39	2.03
151.3	1.11	1.42	2.09
171.5	1.11	1.43	2.11
211.8	1.12	1.44	2.09
232.0	1.12	1.47	2.15
272.3	1.15	1.51	2.18
292.5	1.16	1.51	2.15
332.8	1.19	1.55	2.20
353.0	1.21	1.58	2.25
393.3	1.27	1.61	2.23
413.5	1.28	1.66	2.31
453.8	1.34	1.73	2.40
474.0	1.38	1.74	2.38
514.3	1.44	1.80	2.43
534.5	1.47	1.83	2.44
574.8	1.55	1.89	2.45
595.0	1.58	1.95	2.53
635.4	1.65	2.06	2.66
655.5	1.69	2.10	2.71
695.9	1.74	2.15	2.78
716.0	1.77	2.16	2.78
756.4	1.85	2.22	2.83
776.5	1.88	2.25	2.86
816.9	1.96	2.31	2.91
837.0	2.01	2.35	2.95
877.4	2.08	2.37	2.92
897.6	2.12	2.36	2.89
937.9	2.23	2.44	2.92
958.1	2.27	2.44	2.92
998.4	2.36	2.46	2.90
1018.6	2.42	2.52	2.96
1058.9	2.57	2.60	3.01
1079.1	2.65	2.63	2.99
1119.4	2.86	2.82	3.16
1139.6	3.00	2.93	3.24
1179.9	3.21	3.08	3.31
1200.1	3.27	3.16	3.38

IF (OUT) (MHz)	IF VSWR @LO=500.1MHz (:1) @LO (dBm)		
	0	+3	+6
0.1	2.01	1.66	1.45
0.2	1.97	1.63	1.43
0.5	2.04	1.69	1.48
1.0	2.14	1.76	1.52
5.0	2.08	1.71	1.50
10.0	2.12	1.73	1.51
22.3	2.06	1.77	1.61
34.5	1.99	1.73	1.51
46.8	1.97	1.67	1.51
59.0	1.92	1.63	1.47
71.3	1.93	1.67	1.49
83.5	1.96	1.68	1.52
95.8	2.02	1.73	1.56
108.0	2.03	1.75	1.56
120.3	2.04	1.76	1.58
132.5	2.02	1.74	1.57
144.8	2.04	1.74	1.58
157.0	2.03	1.74	1.57
181.5	2.06	1.77	1.60
193.8	2.11	1.81	1.64
206.0	2.15	1.84	1.67
218.3	2.17	1.86	1.67
230.5	2.15	1.85	1.67
242.8	2.12	1.82	1.65
255.0	2.10	1.80	1.64
267.3	2.09	1.80	1.63
279.5	2.11	1.81	1.65
291.8	2.12	1.82	1.66
304.0	2.13	1.84	1.67
328.5	2.13	1.85	1.67
340.8	2.13	1.85	1.68
353.0	2.13	1.84	1.68
365.3	2.11	1.84	1.68
377.5	2.12	1.85	1.69
389.8	2.15	1.88	1.72
402.0	2.19	1.92	1.76
426.5	2.21	1.94	1.77
438.8	2.19	1.92	1.76
451.0	2.17	1.90	1.75
463.3	2.16	1.90	1.76
487.8	2.22	1.96	1.81
500.0	2.18	2.06	2.01

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	18	33	21	27	21	46	36	47	39	57
1	-	16	0	27	14	33	23	38	39	46	41	61
2	107	73	62	63	62	61	58	73	54	70	64	69
3	111	63	70	69	61	86	57	73	59	79	64	83
4	116	89	95	89	85	78	85	83	84	89	92	102
5	121	94	87	96	84	83	77	89	86	97	84	94
6	131	103	102	92	106	96	81	91	92	105	116	101
7	114	101	101	104	98	96	89	77	86	100	101	102
8	118	100	106	114	113	98	101	99	70	93	91	98
9	117	110	108	108	113	105	97	93	100	68	103	92
10	128	107	100	111	104	97	116	97	101	96	67	90
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:
RF IN: 250.1 MHz; -15.00 dBm.
LO IN: 280.01 MHz; +3.00 dBm
IF OUT: 29.91 MHz; -20.89 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	27	42	33	40	34	54	52	72	59	70
1	-	17	0	28	14	37	24	41	43	52	52	66
2	98	58	50	58	52	63	51	57	48	72	61	67
3	93	45	47	49	50	53	48	51	52	57	55	64
4	90	68	70	69	79	66	77	65	70	71	66	80
5	93	70	67	67	58	69	54	64	53	77	56	73
6	97	83	88	81	93	96	77	87	78	82	79	81
7	93	79	77	86	73	87	74	75	70	74	69	76
8	96	95	92	89	94	88	103	93	89	92	95	92
9	97	102	89	104	81	100	81	92	89	71	96	89
10	95	103	101	103	107	100	97	90	96	94	83	95
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

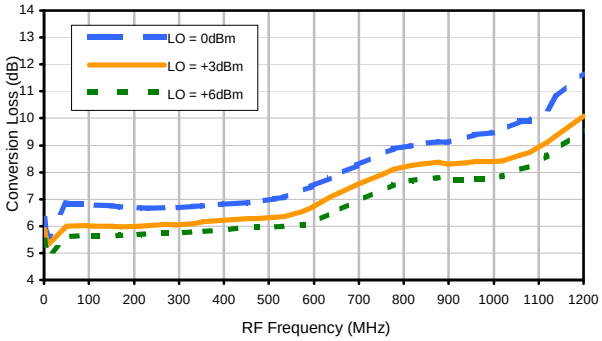
LO HARMONICS ORDER

Test conditions:
RF IN: 250.1 MHz; -5.00 dBm.
LO IN: 280.01 MHz; +3.00 dBm
IF OUT: 29.91 MHz; -11.01 dBm

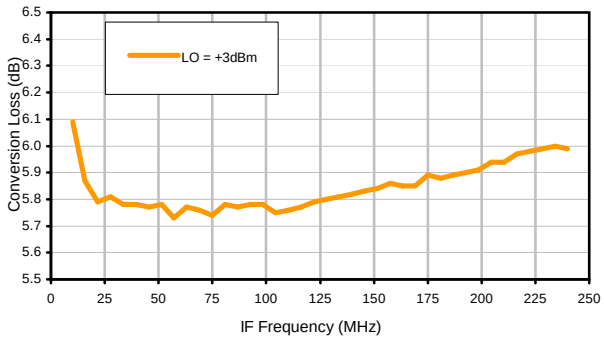
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Typical Performance Curves

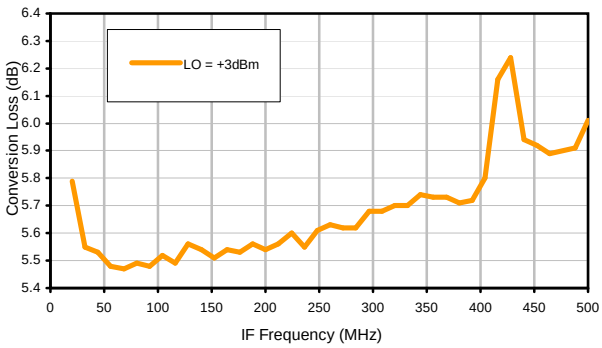
Conversion Loss @ IF=30MHz



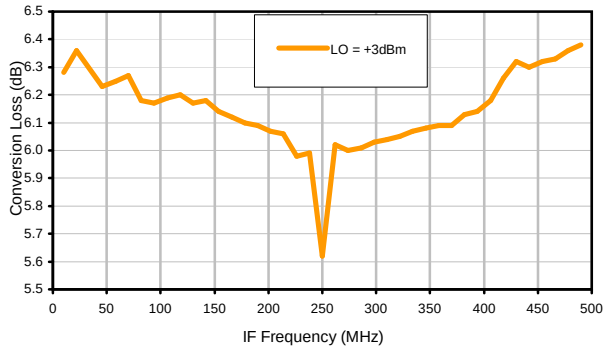
Conversion Loss vs. IF @ RF=250.1MHz



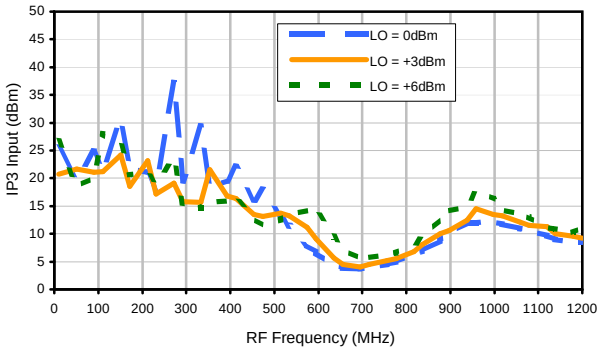
Conversion Loss vs. IF @ RF=10.1MHz



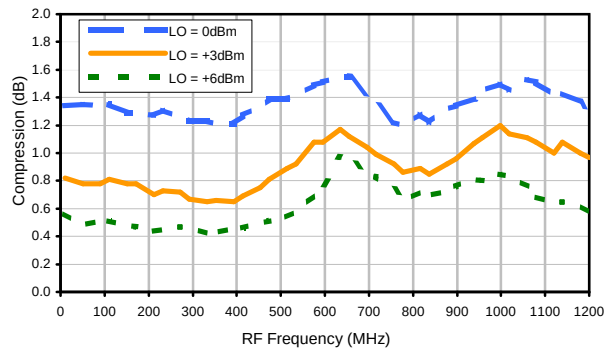
Conversion Loss vs. IF @ RF=500.1MHz



IP3 Input

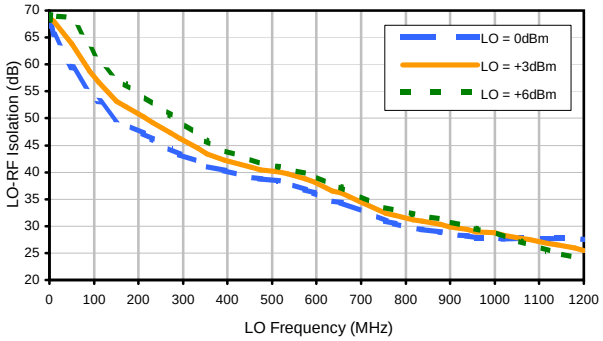


Compression @ RF IN=0dBm

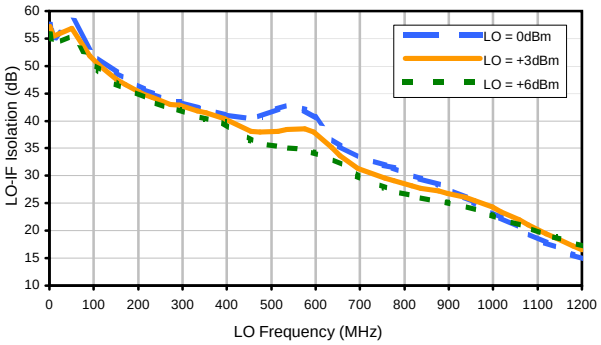


Typical Performance Curves

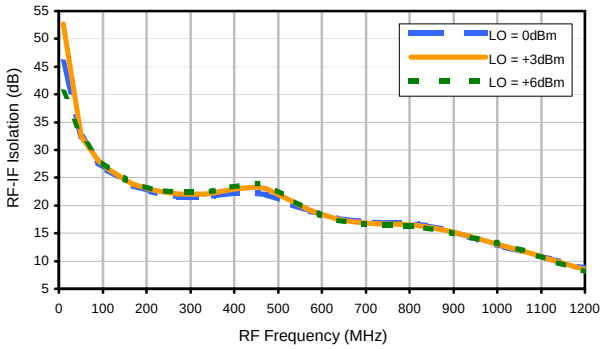
LO-RF Isolation



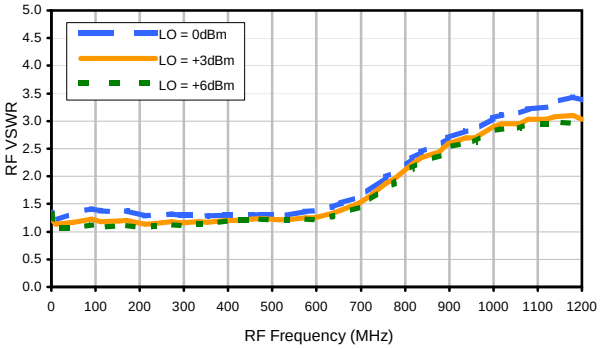
LO-IF Isolation



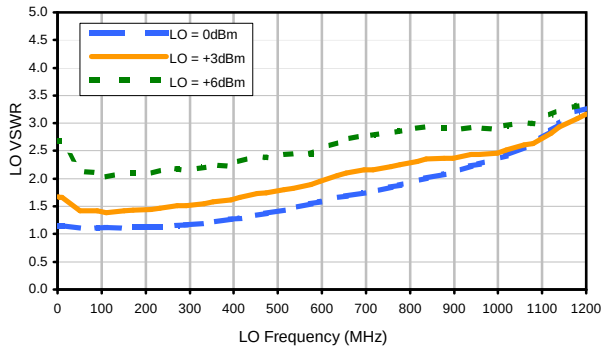
RF-IF Isolation



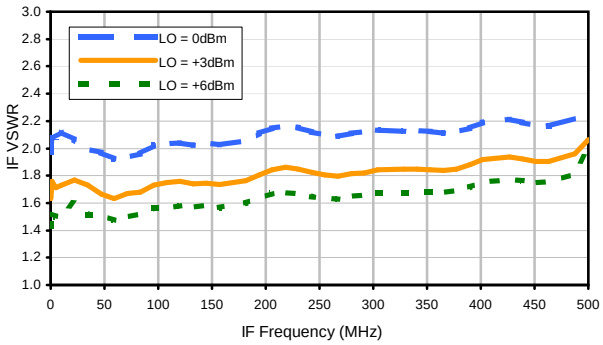
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	18	33	21	27	21	46	36	47	39	57
1	-	16	0	27	14	33	23	38	39	46	41	61
2	107	73	62	63	62	61	58	73	54	70	64	69
3	111	63	70	69	61	86	57	73	59	79	64	83
4	116	89	95	89	85	78	85	83	84	89	92	102
5	121	94	87	96	84	83	77	89	86	97	84	94
6	131	103	102	92	106	96	81	91	92	105	116	101
7	114	101	101	104	98	96	89	77	86	100	101	102
8	118	100	106	114	113	98	101	99	70	93	91	98
9	117	110	108	108	113	105	97	93	100	68	103	92
10	128	107	100	111	104	97	116	97	101	96	67	90
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 250.1 MHz; -15.00 dBm.**
LO IN: 280.01 MHz; +3.00 dBm
IF OUT: 29.91 MHz; -20.89 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	27	42	33	40	34	54	52	72	59	70
1	-	17	0	28	14	37	24	41	43	52	52	66
2	98	58	50	58	52	63	51	57	48	72	61	67
3	93	45	47	49	50	53	48	51	52	57	55	64
4	90	68	70	69	79	66	77	65	70	71	66	80
5	93	70	67	67	58	69	54	64	53	77	56	73
6	97	83	88	81	93	96	77	87	78	82	79	81
7	93	79	77	86	73	87	74	75	70	74	69	76
8	96	95	92	89	94	88	103	93	89	92	95	92
9	97	102	89	104	81	100	81	92	89	71	96	89
10	95	103	101	103	107	100	97	90	96	94	83	95
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

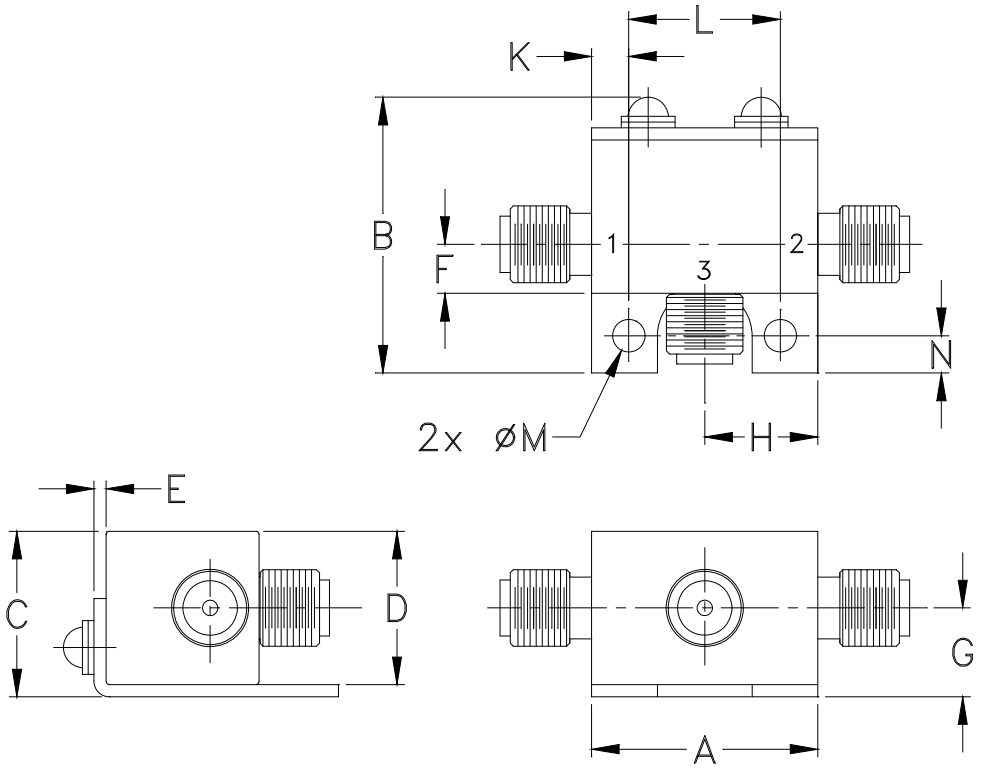
Test conditions: **RF IN: 250.1 MHz; -5.00 dBm.**
LO IN: 280.01 MHz; +3.00 dBm
IF OUT: 29.91 MHz; -11.01 dBm

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.

Case Style FL

FL905

Outline Dimensions



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	WT, GRAM
FL905	.74 (18.80)	.90 (22.86)	.54 (13.72)	.50 (12.70)	.04 (1.02)	.16 (4.06)	.29 (7.37)	.37 (9.40)	- -	.122 (3.10)	.496 (12.60)	.106 (2.69)	.122 (3.10)	20.0

Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .015.
Tolerance on hole size and interaxes dimensions to be ±.005.

Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.

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Environmental Specifications **ENV28T5**

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	-40° to 85°C	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
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	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I