Coaxial

Frequency Mixer

ZX05-1HW+
ZX05-1HW

Level 17 (LO Power +17 dBm) 5 to 750 MHz

CASE STYLE: FL905

Connectors	Model	Price	Qty.
SMA	ZX05-1HW-S(+)	$41.95 ea.	(1-24)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

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	200mW
IF Current	40mA

Coaxial Connections

LO	1
RF	2
IF	3

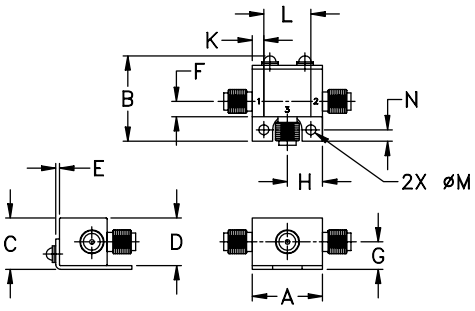
Features

- rugged construction
- small size
- low convesion 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	IF																	
f_L-f_U		$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
5-750	DC-750	6.0	0.1	8.6	9.0	64	45	48	35	42	28	50	35	40	30	30	20	26

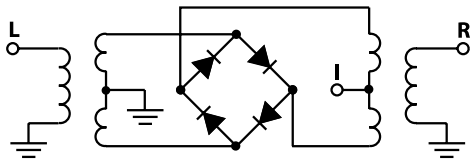
1 dB COMP.: +14 dBm typ.
Positive phase detection
Conversion loss specification at 30 MHz IF

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

Typical Performance Data

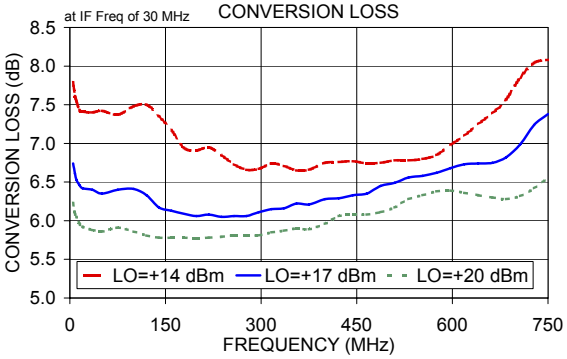
Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm
5.10	35.10	6.74	94.96	63.87	1.31	1.53
35.10	65.10	6.40	67.86	54.58	1.12	1.48
75.10	45.10	6.40	60.85	49.58	1.11	1.61
120.10	90.10	6.33	56.83	47.30	1.07	1.61
139.72	109.72	6.17	55.81	45.58	1.04	1.61
159.33	129.33	6.13	54.98	44.04	1.03	1.61
198.56	168.56	6.06	52.51	43.49	1.03	1.58
237.79	207.79	6.05	52.13	42.27	1.04	1.56
277.02	247.02	6.06	49.94	42.33	1.05	1.56
316.25	286.25	6.15	48.93	42.92	1.07	1.54
355.49	325.49	6.22	49.43	41.63	1.08	1.60
400.10	370.10	6.28	49.34	39.26	1.10	1.63
443.85	413.85	6.33	47.39	37.31	1.11	1.68
487.60	457.60	6.45	43.70	35.86	1.13	1.74
531.35	479.48	6.56	42.87	33.92	1.14	1.79
575.10	545.10	6.62	42.60	31.89	1.15	1.82
618.85	588.85	6.73	42.18	30.57	1.16	1.85
662.60	632.60	6.75	42.16	29.55	1.19	1.91
706.35	676.35	6.99	40.42	29.93	1.24	2.03
750.10	720.10	7.38	40.62	29.75	1.36	2.11

Electrical Schematic

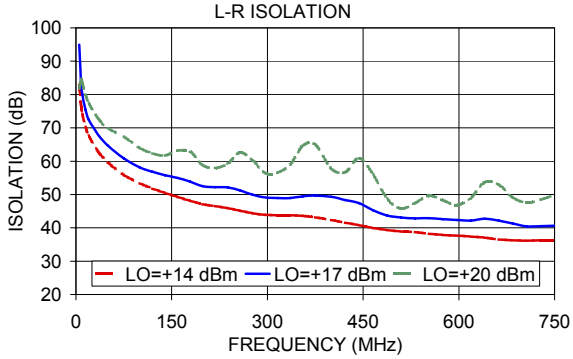


Performance Charts

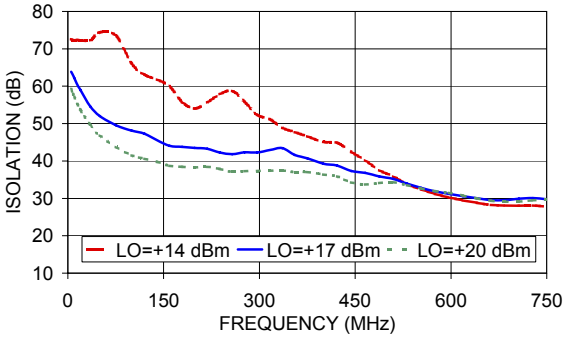
ZX05-1HW
CONVERSION LOSS
at IF Freq of 30 MHz



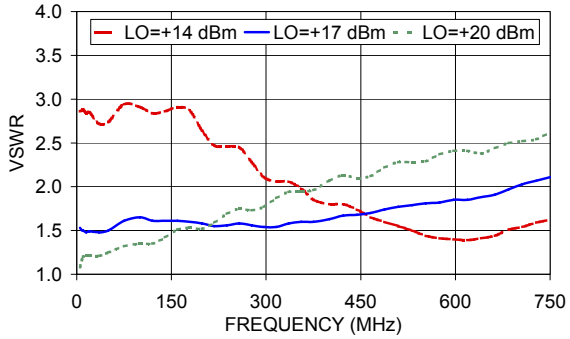
ZX05-1HW
L-R ISOLATION



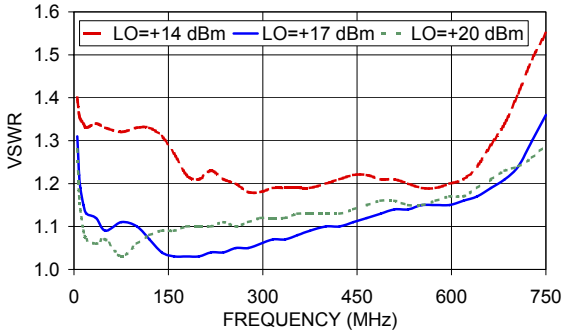
ZX05-1HW
L-I ISOLATION



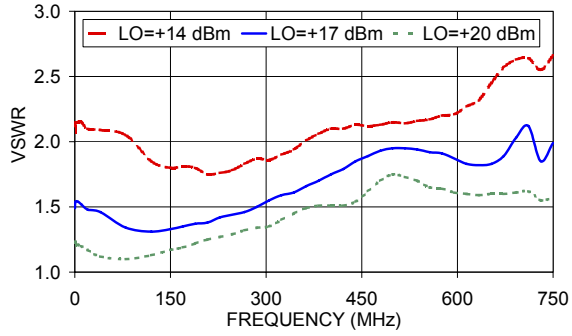
ZX05-1HW
RF VSWR



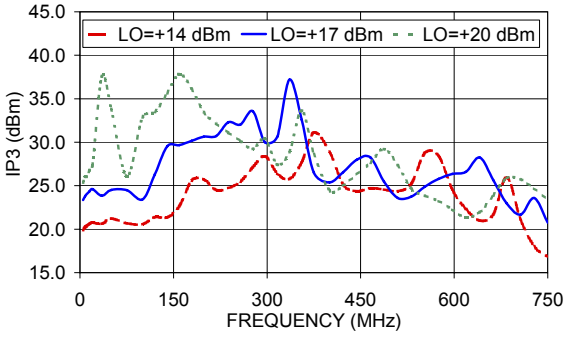
ZX05-1HW
LO VSWR



ZX05-1HW
IF VSWR



ZX05-1HW
IP3



Frequency Mixer ZX05-1HW

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+14	+17	+20
5.1	35.1	7.24	6.34	5.94
10.1	40.1	7.35	6.38	5.86
50.4	80.4	7.39	6.38	5.91
90.7	120.7	7.62	6.29	5.85
131.0	161.0	7.14	6.12	5.86
171.3	201.3	6.88	6.12	5.88
211.5	241.5	6.98	6.17	5.92
251.8	281.8	6.77	6.16	5.98
292.1	322.1	6.85	6.18	6.00
332.4	362.4	6.84	6.32	6.05
372.7	402.7	6.91	6.32	6.13
413.0	443.0	6.98	6.36	6.15
453.3	483.3	6.99	6.51	6.17
493.6	523.6	6.91	6.56	6.30
533.9	563.9	6.95	6.65	6.43
574.2	604.2	7.00	6.65	6.43
614.4	644.4	7.22	6.71	6.39
654.7	684.7	7.59	6.73	6.35
695.0	725.0	8.01	7.03	6.38
735.3	765.3	8.31	7.57	6.64
775.6	805.6	8.38	7.74	6.96
815.9	845.9	8.62	8.02	7.33
856.2	886.2	8.81	8.17	7.57
896.5	926.5	8.99	8.34	7.79
916.6	946.6	9.10	8.50	7.94
956.9	986.9	9.31	8.63	8.05
977.1	1007.1	9.46	8.72	8.06
1017.3	1047.3	9.80	8.83	8.01
1037.5	1067.5	9.97	8.82	7.95
1077.8	1107.8	10.57	8.90	7.91
1097.9	1127.9	10.77	8.88	7.83
1158.4	1188.4	11.71	8.96	7.96
1198.7	1228.7	12.30	9.06	8.22
1218.8	1248.8	12.41	9.11	8.40
1259.1	1289.1	13.03	9.54	8.77
1279.2	1309.2	13.37	9.76	9.00
1319.5	1349.5	13.43	10.08	9.47
1339.7	1369.7	13.58	10.37	9.77
1380.0	1410.0	14.01	10.99	10.31
1400.1	1430.1	13.99	11.15	10.52

RF (IN) (MHz)	LO (MHz)	IP-3 INPUT (dBm) @LO (dBm)		
		+14	+17	+20
10.1	40.1	18.30	23.34	25.67
50.4	80.4	20.45	22.89	30.58
90.7	120.7	20.07	28.27	32.23
131.0	161.0	26.56	29.04	32.04
171.3	201.3	25.31	29.68	31.05
211.5	241.5	23.59	29.13	27.66
251.8	281.8	25.92	28.56	28.25
292.1	322.1	25.40	32.30	26.61
332.4	362.4	25.59	23.79	25.59
372.7	402.7	27.19	24.80	23.10
413.0	443.0	23.69	27.91	25.46
453.3	483.3	24.32	25.56	27.97
493.6	523.6	27.28	23.98	23.69
533.9	563.9	31.86	24.02	22.48
574.2	604.2	25.53	23.74	21.49
614.4	644.4	22.84	23.91	21.71
654.7	684.7	25.21	24.56	26.15
695.0	725.0	17.20	22.98	26.78
735.3	765.3	15.15	17.61	24.16
775.6	805.6	15.15	15.49	21.28
815.9	845.9	15.42	14.97	17.29
856.2	886.2	16.07	15.26	16.07
896.5	926.5	16.52	15.75	15.81
916.6	946.6	17.05	16.20	16.19
956.9	986.9	17.84	17.04	16.82
977.1	1007.1	18.39	17.74	17.37
1017.3	1047.3	19.41	18.29	18.15
1037.5	1067.5	19.78	18.90	19.04
1077.8	1107.8	19.43	19.78	19.81
1097.9	1127.9	19.24	19.79	20.22
1138.2	1168.2	18.59	18.84	20.72
1158.4	1188.4	18.09	18.18	20.64
1198.7	1228.7	18.14	17.31	20.25
1218.8	1248.8	18.21	17.18	20.15
1259.1	1289.1	18.31	17.13	19.70
1279.2	1309.2	18.51	17.31	19.59
1319.5	1349.5	23.63	18.33	19.50
1339.7	1369.7	28.46	18.56	19.94
1380.0	1410.0	23.20	19.50	21.27
1400.1	1430.1	20.48	20.28	21.83

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB) @LO (dBm)		
		+14	+17	+20
10.1	40.1	0.12	0.17	0.11
50.4	80.4	0.25	0.21	0.12
90.7	120.7	0.31	0.21	0.13
131.0	161.0	0.64	0.30	0.12
171.3	201.3	0.54	0.24	0.12
211.5	241.5	0.81	0.32	0.15
251.8	281.8	0.79	0.29	0.16
292.1	322.1	0.85	0.38	0.18
332.4	362.4	0.88	0.30	0.20
372.7	402.7	0.81	0.33	0.19
413.0	443.0	0.90	0.44	0.23
453.3	483.3	0.89	0.31	0.29
493.6	523.6	1.13	0.41	0.29
533.9	563.9	1.36	0.50	0.31
574.2	604.2	1.51	0.65	0.42
614.4	644.4	1.69	0.99	0.60
654.7	684.7	1.59	1.24	0.71
695.0	725.0	1.55	1.33	0.97
735.3	765.3	1.47	1.03	1.09
775.6	805.6	1.59	0.99	1.03
815.9	845.9	1.58	0.93	0.89
856.2	886.2	1.49	0.88	0.79
896.5	926.5	1.62	0.88	0.75
916.6	946.6	1.64	0.84	0.72
956.9	986.9	1.65	0.83	0.68
977.1	1007.1	1.79	0.83	0.70
1017.3	1047.3	1.71	0.90	0.86
1037.5	1067.5	1.59	0.95	0.95
1077.8	1107.8	1.33	1.12	1.08
1097.9	1127.9	1.25	1.21	1.18
1138.2	1168.2	0.94	1.39	1.16
1158.4	1188.4	0.90	1.55	1.22
1198.7	1228.7	0.77	1.74	1.20
1218.8	1248.8	0.77	1.81	1.19
1259.1	1289.1	0.71	1.89	1.17
1279.2	1309.2	0.78	1.83	1.11
1319.5	1349.5	0.93	1.75	1.06
1339.7	1369.7	1.16	1.72	1.01
1380.0	1410.0	1.39	1.71	1.03
1400.1	1430.1	1.45	1.62	1.04

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=375.1MHz (dB) @LO (dBm) +17
365.0	10.1	6.53
355.9	19.2	6.60
346.8	28.3	6.68
337.7	37.4	6.51
328.6	46.5	6.57
319.5	55.6	6.42
310.4	64.7	6.35
301.3	73.8	6.37
292.2	82.9	6.19
283.1	92.0	6.26
274.0	101.1	6.15
264.9	110.2	6.11
255.8	119.3	6.10
246.7	128.4	5.98
237.6	137.5	6.05
228.5	146.6	5.96
219.4	155.7	5.93
210.3	164.8	5.94
201.2	173.9	5.92
192.1	183.0	5.88
182.9	192.2	5.87
173.8	201.3	5.94
164.7	210.4	5.95
155.6	219.5	5.93
146.5	228.6	5.97
137.4	237.7	5.99
128.3	246.8	5.97
119.2	255.9	5.95
110.1	265.0	5.97
101.0	274.1	6.02
91.9	283.2	5.99
82.8	292.3	6.01
73.7	301.4	6.06
64.6	310.5	6.09
55.5	319.6	6.08
46.4	328.7	6.10
37.3	337.8	6.17
28.2	346.9	6.21
19.1	356.0	6.19
10.0	365.1	6.32

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) @LO (dBm) +17
10.0	20.1	6.44
28.7	38.8	6.29
47.4	57.5	6.37
66.2	76.3	6.25
84.9	95.0	6.15
103.6	113.7	6.03
122.3	132.4	6.07
141.0	151.1	6.12
159.7	169.8	6.11
178.5	188.6	6.07
197.2	207.3	6.08
215.9	226.0	6.16
234.6	244.7	6.19
253.3	263.4	6.27
272.1	282.2	6.23
290.8	300.9	6.27
309.5	319.6	6.29
328.2	338.3	6.40
346.9	357.0	6.39
365.6	375.7	6.48
384.4	394.5	6.46
403.1	413.2	6.44
421.8	431.9	6.52
440.5	450.6	6.63
459.2	469.3	6.72
477.9	488.0	6.72
496.7	506.8	6.83
515.4	525.5	6.78
534.1	544.2	6.80
552.8	562.9	6.76
571.5	581.6	6.71
590.3	600.4	6.67
609.0	619.1	6.65
627.7	637.8	6.64
646.4	656.5	6.57
665.1	675.2	6.54
683.8	693.9	6.49
702.6	712.7	6.54
721.3	731.4	6.71
740.0	750.1	6.86

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=750.1MHz (dB) @LO (dBm) +17
740.0	10.1	7.04
721.3	28.8	7.08
702.6	47.5	6.95
683.8	66.3	6.61
665.1	85.0	6.51
646.4	103.7	6.43
627.7	122.4	6.41
609.0	141.1	6.32
590.3	159.8	6.22
571.5	178.6	6.23
552.8	197.3	6.21
534.1	216.0	6.22
515.4	234.7	6.20
496.7	253.4	6.24
477.9	272.2	6.19
459.2	290.9	6.25
440.5	309.6	6.31
421.8	328.3	6.31
403.1	347.0	6.29
384.4	365.7	6.35
365.6	384.5	6.42
346.9	403.2	6.41
328.2	421.9	6.48
309.5	440.6	6.49
290.8	459.3	6.51
272.1	478.0	6.51
253.3	496.8	6.61
234.6	515.5	6.59
215.9	534.2	6.69
197.2	552.9	6.69
178.5	571.6	6.75
159.7	590.4	6.81
141.0	609.1	6.82
122.3	627.8	6.84
103.6	646.5	6.78
84.9	665.2	6.82
66.2	683.9	6.75
47.4	702.7	6.87
28.7	721.4	7.02
10.0	740.1	7.29

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+14	+17	+20	+14	+17	+20
5.1	61.40	64.80	68.50	64.40	52.10	47.90
10.1	60.70	64.50	68.40	65.30	50.90	46.90
50.4	57.76	61.86	67.84	59.66	57.37	50.00
90.7	53.73	57.66	63.02	57.72	52.69	45.94
131.0	49.62	53.69	60.95	49.37	52.88	43.45
171.3	47.56	51.71	58.50	48.42	50.34	42.37
211.5	45.66	50.41	57.92	46.74	49.87	41.61
251.8	43.98	48.91	56.09	44.75	53.31	42.30
292.1	43.09	47.46	53.95	44.97	49.46	41.46
332.4	41.80	46.38	52.59	41.17	47.18	41.29
372.7	41.32	46.11	53.11	40.71	44.97	41.52
413.0	40.45	46.11	53.62	40.38	41.36	39.10
453.3	39.34	44.06	50.56	38.15	37.65	36.51
493.6	38.31	42.17	47.97	36.31	35.82	34.39
533.9	37.65	41.34	46.16	33.87	34.71	34.09
574.2	37.45	41.46	47.02	31.63	33.28	33.70
614.4	36.81	40.88	46.45	29.90	31.99	32.62
654.7	36.54	41.31	48.07	28.21	30.74	31.89
695.0	35.83	41.22	47.74	27.30	29.80	30.79
735.3	34.63	39.47	46.74	26.93	28.95	29.21
775.6	34.30	38.55	46.16	27.08	29.05	29.26
815.9	33.95	38.31	45.85	26.63	28.49	29.43
856.2	33.22	37.82	45.57	25.74	27.51	28.96
896.5	32.40	36.70	43.45	24.98	26.66	28.25
916.6	31.83	35.63	40.66	24.37	25.97	27.52
956.9	31.12	34.82	39.86	23.47	25.04	26.64
977.1	30.69	34.42	39.96	23.02	24.50	26.22
1017.3	29.97	33.71	39.87	22.13	23.49	25.32
1037.5	29.74	33.77	41.31	21.68	22.96	24.99
1077.8	28.90	33.04	41.80	21.09	22.39	24.77
1097.9	28.60	32.54	41.01	20.59	21.83	24.28
1158.4	27.40	31.53	42.23	19.31	20.79	23.22
1198.7	26.49	30.81	40.01	18.54	20.00	22.04
1218.8	26.14	30.54	37.97	18.10	19.60	21.55
1259.1	25.31	29.76	34.51	17.39	18.94	20.50
1279.2	24.99	29.17	33.68	17.02	18.36	19.97
1319.5	24.20	27.88	30.98	16.41	17.47	18.98
1339.7	23.94	27.51	30.44	15.93	17.12	18.66
1380.0	23.31	25.96	28.62	15.62	16.32	17.91
1400.1	23.15	25.39	27.97	15.49	15.96	17.63

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+14	+17	+20
10.1	40.1	45.19	53.90	56.96
50.4	80.4	36.51	36.99	37.68
90.7	120.7	31.43	32.48	32.74
131.0	161.0	28.97	29.69	29.96
171.3	201.3	27.34	28.02	28.23
211.5	241.5	25.93	26.61	26.90
251.8	281.8	25.31	25.91	26.28
292.1	322.1	24.57	25.47	25.86
332.4	362.4	24.18	24.91	25.37
372.7	402.7	24.12	24.73	25.10
413.0	443.0	23.98	24.63	24.85
453.3	483.3	23.95	24.61	24.97
493.6	523.6	23.71	24.18	24.62
533.9	563.9	22.81	23.02	23.26
574.2	604.2	21.68	21.78	22.01
614.4	644.4	20.42	20.33	20.34
654.7	684.7	19.70	19.32	19.22
695.0	725.0	19.76	19.43	19.15
735.3	765.3	19.72	19.66	19.35
775.6	805.6	19.42	19.34	19.34
815.9	845.9	19.24	19.12	19.10
856.2	886.2	18.91	18.88	18.88
896.5	926.5	18.38	18.42	18.68
916.6	946.6	18.15	18.23	18.38
956.9	986.9	17.50	17.68	17.97
977.1	1007.1	17.15	17.50	17.76
1017.3	1047.3	16.40	16.94	17.00
1037.5	1067.5	15.95	16.60	16.57
1077.8	1107.8	15.06	15.80	15.75
1097.9	1127.9	14.61	15.34	15.27
1138.2	1168.2	13.58	14.30	14.29
1158.4	1188.4	13.04	13.80	13.82
1198.7	1228.7	12.08	12.79	12.74
1218.8	1248.8	11.65	12.27	12.12
1259.1	1289.1	10.67	11.29	11.09
1279.2	1309.2	10.27	10.83	10.58
1319.5	1349.5	9.45	9.86	9.64
1339.7	1369.7	8.95	9.37	9.20
1380.0	1410.0	8.32	8.51	8.49
1400.1	1430.1	8.06	8.15	8.12

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+14	+17	+20
5.1	35.1	1.44	1.35	1.34
10.1	40.1	1.44	1.19	1.12
50.4	80.4	1.33	1.11	1.04
90.7	120.7	1.34	1.08	1.05
131.0	161.0	1.26	1.04	1.06
171.3	201.3	1.21	1.02	1.07
211.5	241.5	1.23	1.03	1.06
251.8	281.8	1.17	1.02	1.07
292.1	322.1	1.20	1.02	1.07
332.4	362.4	1.18	1.03	1.07
372.7	402.7	1.17	1.03	1.07
413.0	443.0	1.17	1.04	1.09
453.3	483.3	1.14	1.06	1.13
493.6	523.6	1.11	1.08	1.13
533.9	563.9	1.09	1.10	1.15
574.2	604.2	1.09	1.11	1.17
614.4	644.4	1.11	1.12	1.19
654.7	684.7	1.17	1.13	1.21
695.0	725.0	1.28	1.15	1.21
735.3	765.3	1.36	1.23	1.23
775.6	805.6	1.42	1.30	1.27
815.9	845.9	1.51	1.39	1.35
856.2	886.2	1.62	1.51	1.45
896.5	926.5	1.73	1.62	1.56
916.6	946.6	1.80	1.68	1.61
956.9	986.9	1.93	1.80	1.72
977.1	1007.1	2.02	1.88	1.79
1017.3	1047.3	2.18	2.00	1.92
1037.5	1067.5	2.28	2.08	2.01
1077.8	1107.8	2.48	2.24	2.17
1097.9	1127.9	2.57	2.32	2.25
1138.2	1168.2	2.80	2.49	2.41
1158.4	1188.4	2.92	2.56	2.47
1198.7	1228.7	3.11	2.70	2.58
1218.8	1248.8	3.18	2.75	2.64
1259.1	1289.1	3.34	2.86	2.71
1279.2	1309.2	3.40	2.90	2.75
1319.5	1349.5	3.39	2.93	2.79
1339.7	1369.7	3.43	2.98	2.84
1380.0	1410.0	3.43	3.00	2.86
1400.1	1430.1	3.43	3.00	2.87

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+14	+17	+20
5.1	2.40	1.38	1.30
10.1	2.48	1.42	1.12
50.4	3.14	1.60	1.26
90.7	2.58	1.57	1.35
131.0	3.16	1.70	1.42
171.3	2.82	1.67	1.51
211.5	2.70	1.62	1.61
251.8	2.59	1.64	1.69
292.1	2.25	1.62	1.80
332.4	2.13	1.62	1.90
372.7	1.94	1.67	1.99
413.0	1.84	1.73	2.13
453.3	1.75	1.75	2.19
493.6	1.71	1.85	2.31
533.9	1.64	1.91	2.40
574.2	1.57	1.97	2.52
614.4	1.54	2.04	2.62
654.7	1.55	2.07	2.66
695.0	1.63	2.16	2.76
735.3	1.72	2.25	2.83
775.6	1.82	2.39	2.98
815.9	1.89	2.49	3.11
856.2	1.97	2.57	3.20
896.5	2.07	2.68	3.33
916.6	2.12	2.72	3.37
956.9	2.22	2.79	3.44
977.1	2.28	2.83	3.48
1017.3	2.42	2.91	3.56
1037.5	2.48	2.95	3.58
1077.8	2.63	3.00	3.61
1097.9	2.72	3.04	3.62
1138.2	2.92	3.14	3.67
1158.4	3.01	3.16	3.65
1198.7	3.24	3.25	3.67
1218.8	3.37	3.33	3.73
1259.1	3.62	3.50	3.85
1279.2	3.76	3.59	3.89
1319.5	4.07	3.83	4.05
1339.7	4.19	3.95	4.13
1380.0	4.45	4.15	4.21
1400.1	4.57	4.24	4.25

IF (OUT) (MHz)	IF VSWR @LO=750.5MHz (:1) @LO (dBm)		
	+14	+17	+20
0.1	2.92	2.20	1.69
0.5	3.01	2.27	1.74
1.0	3.11	2.35	1.78
5.0	3.11	2.35	1.77
10.0	3.30	2.33	1.69
28.5	3.56	2.53	1.82
47.0	3.38	2.42	1.77
65.5	3.12	2.25	1.67
84.0	3.23	2.32	1.70
102.5	3.33	2.38	1.76
121.0	3.28	2.36	1.75
139.5	3.22	2.32	1.72
158.0	3.18	2.31	1.72
176.5	3.30	2.40	1.80
195.0	3.31	2.40	1.79
213.5	3.18	2.32	1.75
232.0	3.21	2.34	1.78
250.5	3.07	2.26	1.74
269.0	3.01	2.23	1.72
287.5	2.98	2.21	1.71
306.0	3.04	2.27	1.77
324.5	2.99	2.24	1.76
343.0	2.84	2.14	1.69
361.5	2.83	2.13	1.69
380.0	2.86	2.17	1.74
398.5	2.83	2.14	1.73
417.0	2.77	2.09	1.69
435.5	2.77	2.09	1.69
454.0	2.74	2.09	1.71
491.0	2.64	2.01	1.65
509.5	2.71	2.06	1.69
528.0	2.62	2.00	1.67
546.5	2.53	1.93	1.62
583.5	2.57	1.96	1.65
602.0	2.54	1.94	1.64
620.5	2.50	1.89	1.60
639.0	2.51	1.89	1.58
657.5	2.50	1.89	1.60
694.5	2.47	1.85	1.55
731.5	2.55	1.90	1.59
750.0	2.33	1.80	1.66

Harmonics Tables

Notes: 1. All Harmonics are relative to IF OUTPUT (dBm)
2. + entry denotes harmonics above IF OUTPUT (dBm)

RF HARMONICS ORDER	RF CAL (-dBm)	0	1	2	3	4	5	6	7	8	9	10
0	-	-	17	32	7	25	17	37	39	42	38	46
1	-	18	+0	32	14	31	30	35	28	58	33	52
2	>100	85	44	57	43	56	40	62	50	59	62	62
3	>100	65	56	66	55	73	49	68	49	65	52	71
4	>100	76	77	78	85	73	75	76	74	74	71	79
5	>100	>92	78	85	79	83	74	80	74	80	77	83
6	>100	>92	>92	89	90	92	86	>92	84	>92	84	>92
7	>100	>92	>92	>92	>92	>92	>92	92	90	>92	>92	>92
8	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
9	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
10	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92

LO HARMONICS ORDER

Test conditions: RF IN: 370.1 MHz; -1.00 dBm.
LO IN: 400.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -7.6 dBm

Notes: 1. All Harmonics are relative to IF OUTPUT (dBm)
2. + entry denotes harmonics above IF OUTPUT (dBm)

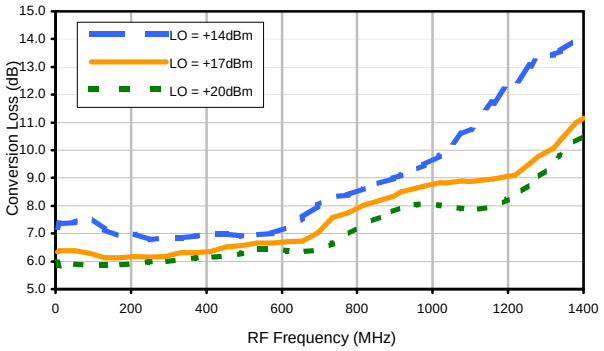
RF HARMONICS ORDER	RF CAL (-dBm)	0	1	2	3	4	5	6	7	8	9	10
0	-	-	27	42	20	37	32	57	55	63	52	62
1	-	19	+0	33	14	34	25	37	36	58	43	55
2	89	57	41	53	38	57	35	54	43	59	64	64
3	>100	51	42	54	47	58	38	50	43	55	42	74
4	>100	65	52	82	52	67	52	65	48	84	61	72
5	>100	73	59	77	53	73	50	63	46	67	49	63
6	>100	89	63	77	65	77	66	78	65	84	63	79
7	>100	83	84	78	67	91	67	78	63	76	60	80
8	>100	99	85	89	79	79	80	78	76	75	69	78
9	>100	100	91	100	80	91	70	80	69	80	70	78
10	>100	102	>102	101	102	93	89	85	78	84	76	83

LO HARMONICS ORDER

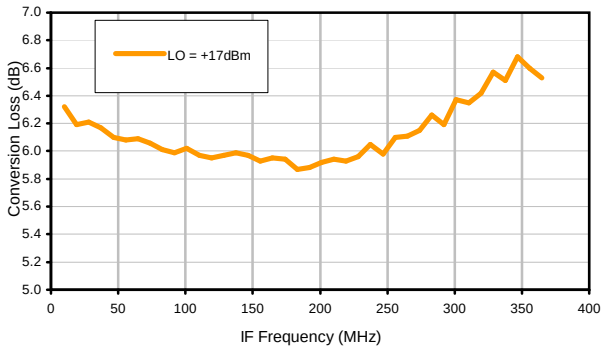
Test conditions: RF IN: 370.1 MHz; 9.00 dBm.
LO IN: 400.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 2.38 dBm

Typical Performance Curves

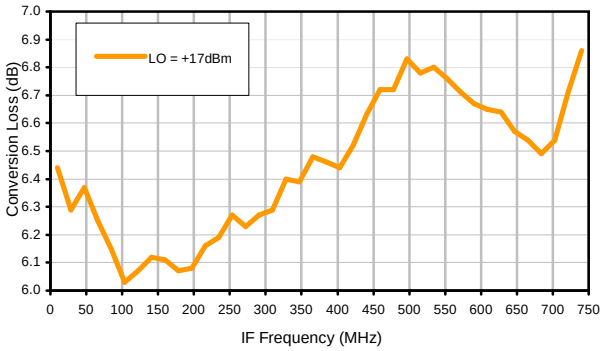
Conversion Loss @ IF=30MHz



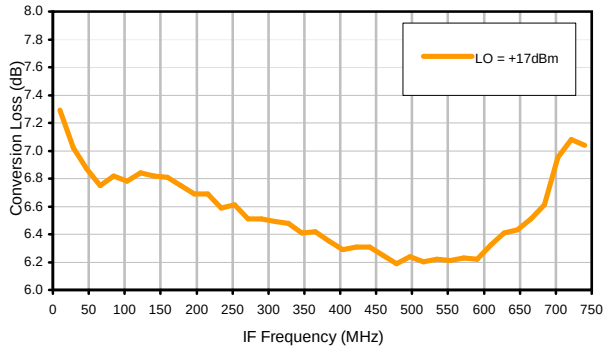
Conversion Loss vs. IF @ RF=375.1MHz



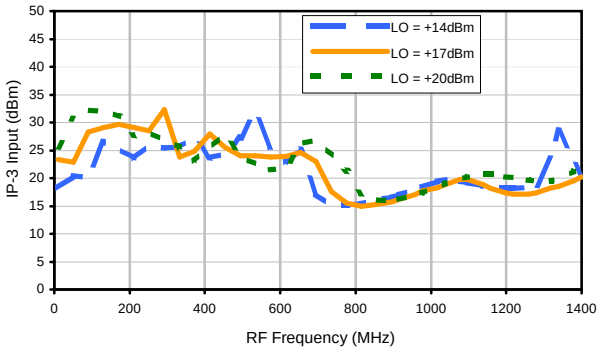
Conversion Loss vs. IF @ RF=10.1MHz



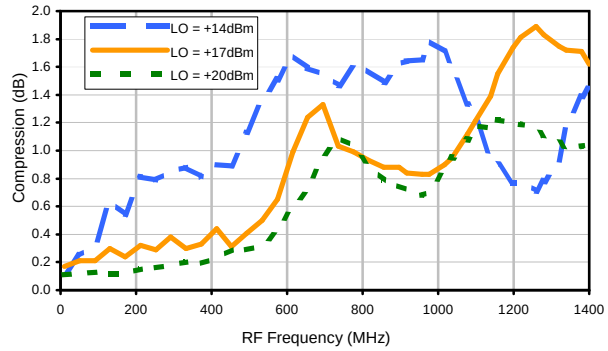
Conversion Loss vs. IF @ RF=750.1MHz



IP-3 Input

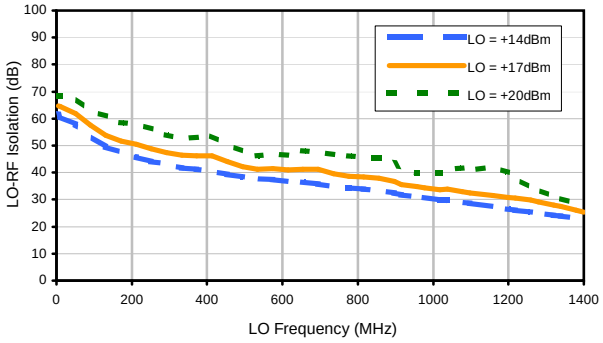


Compression @ RF IN=+14dBm

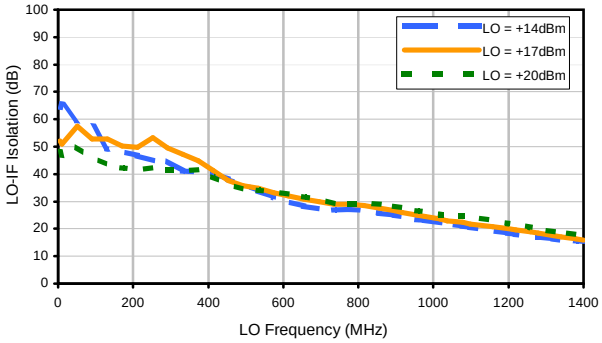


Typical Performance Curves

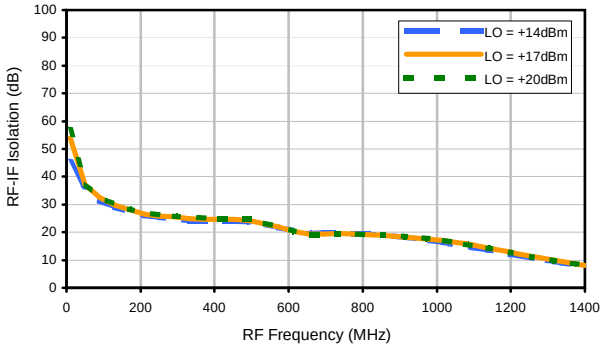
LO-RF Isolation



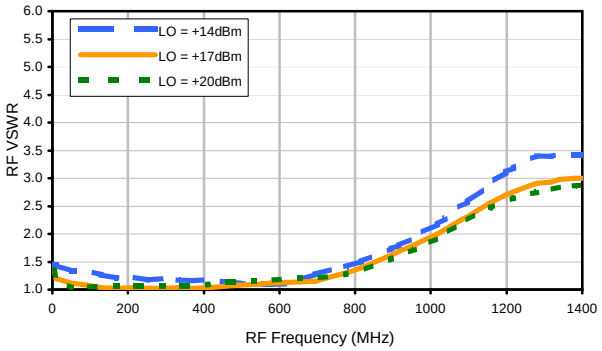
LO-IF Isolation



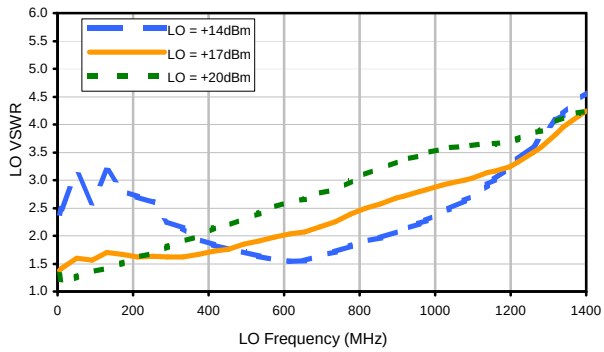
RF-IF Isolation



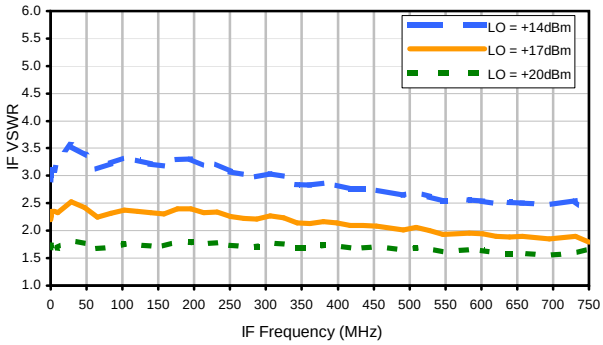
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

Notes: 1. All Harmonics are relative to IF OUTPUT (dBm)
2. + entry denotes harmonics above IF OUTPUT (dBm)

RF HARMONICS ORDER	RF CAL (-dBm)	0	1	2	3	4	5	6	7	8	9	10
0	-	-	17	32	7	25	17	37	39	42	38	46
1	-	18	+0	32	14	31	30	35	28	58	33	52
2	>100	85	44	57	43	56	40	62	50	59	62	62
3	>100	65	56	66	55	73	49	68	49	65	52	71
4	>100	76	77	78	85	73	75	76	74	74	71	79
5	>100	>92	78	85	79	83	74	80	74	80	77	83
6	>100	>92	>92	89	90	92	86	>92	84	>92	84	>92
7	>100	>92	>92	>92	>92	>92	>92	92	90	>92	>92	>92
8	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
9	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
10	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92

LO HARMONICS ORDER

Test conditions: RF IN: 370.1 MHz; -1.00 dBm.
LO IN: 400.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -7.6 dBm

Notes: 1. All Harmonics are relative to IF OUTPUT (dBm)
2. + entry denotes harmonics above IF OUTPUT (dBm)

RF HARMONICS ORDER	RF CAL (-dBm)	0	1	2	3	4	5	6	7	8	9	10
0	-	-	27	42	20	37	32	57	55	63	52	62
1	-	19	+0	33	14	34	25	37	36	58	43	55
2	89	57	41	53	38	57	35	54	43	59	64	64
3	>100	51	42	54	47	58	38	50	43	55	42	74
4	>100	65	52	82	52	67	52	65	48	84	61	72
5	>100	73	59	77	53	73	50	63	46	67	49	63
6	>100	89	63	77	65	77	66	78	65	84	63	79
7	>100	83	84	78	67	91	67	78	63	76	60	80
8	>100	99	85	89	79	79	80	78	76	75	69	78
9	>100	100	91	100	80	91	70	80	69	80	70	78
10	>100	102	>102	101	102	93	89	85	78	84	76	83

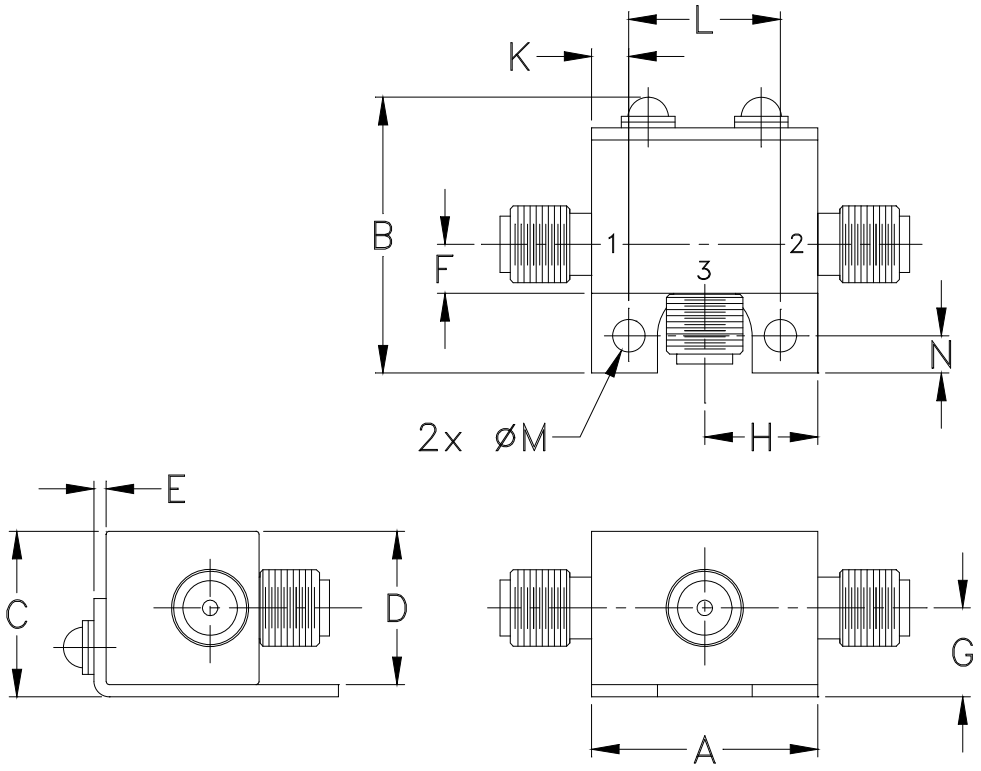
LO HARMONICS ORDER

Test conditions: RF IN: 370.1 MHz; 9.00 dBm.
LO IN: 400.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 2.38 dBm

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

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