Surface Mount

Frequency Mixer

ADE-10H

Level 17 (LO Power +17 dBm) 10 to 1000 MHz

Generic photo used for illustration purposes only

CASE STYLE: CD542

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	200mW
IF Current	40mA

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

Pin Connections

LO	6
RF	3
IF	2
GROUND	1,4,5

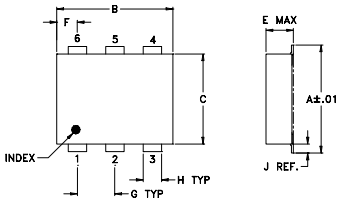
Features

- excellent L-R isolation, 55 dB typ.
- excellent conversion loss flatness, ±0.35 dB typ. over entire band
- low conversion loss, 7.0 dB typ.
- good VSWR, 1.4:1 typ. for LO, 1.6:1typ. for RF, 1.4:1 typ. for IF
- good performance to 1500 MHz
- aqueous washable
- protected by U.S. Patents 6,133,525 and 6,947,717

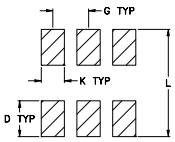
Applications

- cellular
- PCN

Outline Drawing



PCB Land Pattern



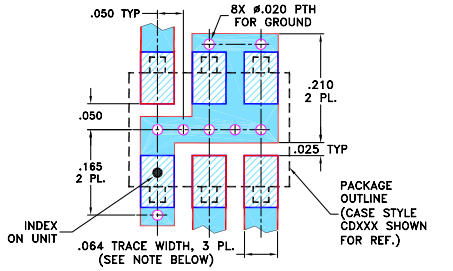
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.272	.310	.220	.100	.112	.055	.100
6.91	7.87	5.59	2.54	2.84	1.40	2.54

H	J	K	L	wt
.030	.026	.065	.300	grams
0.76	0.66	1.65	7.62	0.20

Demo Board MCL P/N: TB-03
Suggested PCB Layout (PL-052)



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Electrical Specifications

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.
10-1000	DC-800	7.0	0.10	8.5†	9.5†	68	55	55	40	47	31	46	30	32	20	26	13	22

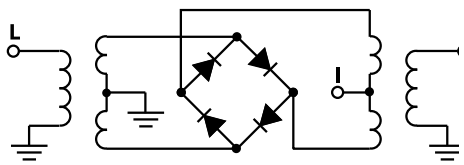
1 dB COMP.: +14 dBm typ.
†Conversion loss increases 0.5 dB when IF is above 150 MHz

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 +17dBm	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm
10.0	40.0	7.3	74.1	50.8	1.6	1.1
22.0	52.0	7.2	71.8	48.3	1.6	1.1
40.0	70.0	7.3	69.3	45.9	1.6	1.1
52.0	82.0	7.3	68.1	44.5	1.6	1.2
70.0	100.0	7.3	66.7	42.7	1.5	1.2
88.0	118.0	7.3	66.0	41.2	1.5	1.2
94.0	124.0	7.2	65.8	40.8	1.5	1.2
100.0	130.0	7.2	65.5	40.4	1.5	1.2
160.0	190.0	7.2	61.7	36.8	1.5	1.3
220.0	250.0	7.0	58.6	34.0	1.5	1.3
280.0	310.0	7.1	56.7	32.8	1.5	1.3
400.0	430.0	7.2	57.3	32.2	1.5	1.3
460.0	490.0	7.2	53.7	31.8	1.5	1.4
520.0	550.0	7.2	50.0	31.5	1.5	1.4
580.0	610.0	7.3	49.1	30.6	1.5	1.4
700.0	730.0	7.7	45.6	29.9	1.6	1.5
760.0	790.0	7.8	44.2	28.5	1.6	1.7
820.0	850.0	7.7	41.9	26.5	1.5	1.7
940.0	970.0	7.5	36.6	23.5	1.4	1.9
1000.0	1030.0	7.4	35.4	22.5	1.3	2.0

Electrical Schematic



Notes
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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.
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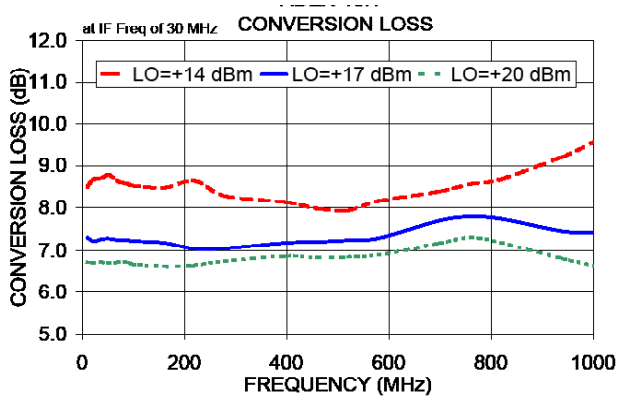
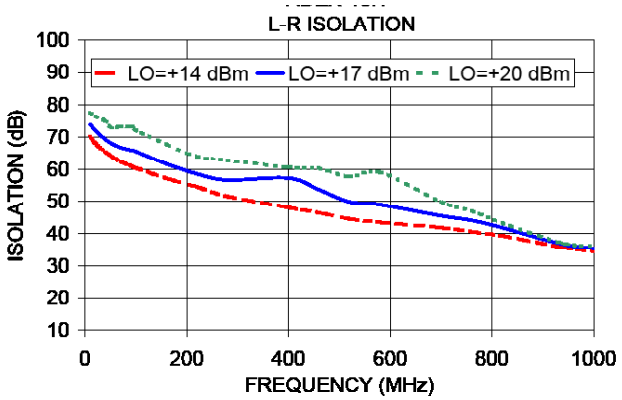
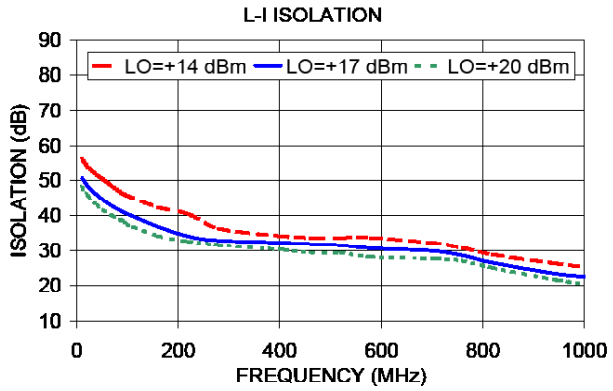
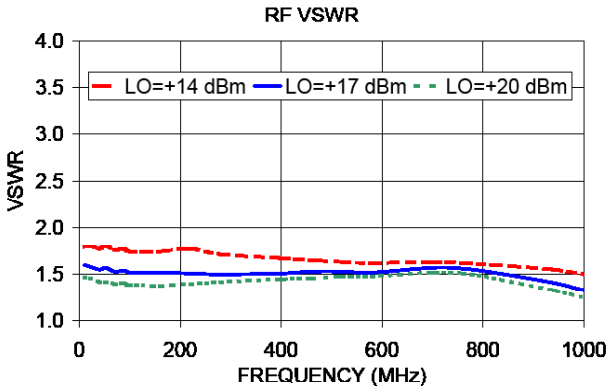
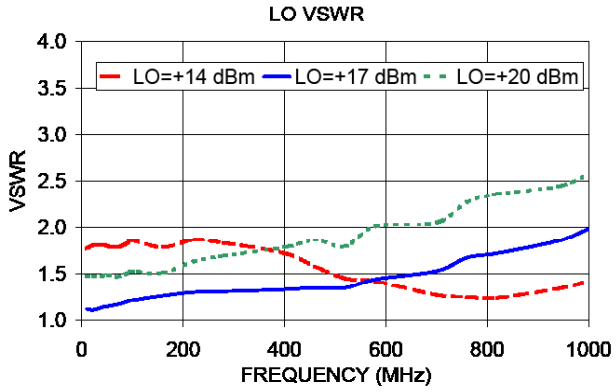
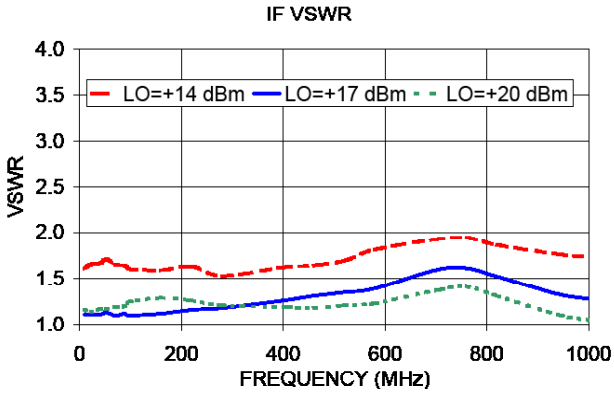












Frequency Mixer ADE-10H

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) @LO (dBm)		
		+14	+17	+20
160.1	190.1	25.06	11.14	7.61
220.1	250.1	12.76	7.92	6.91
280.1	310.1	8.88	7.07	6.74
340.1	370.1	8.01	6.93	6.65
400.1	430.1	7.34	6.78	6.54
460.1	490.1	7.19	6.75	6.54
520.1	550.1	7.21	6.74	6.50
580.1	610.1	7.22	6.72	6.41
640.1	670.1	7.17	6.82	6.50
700.1	730.1	7.10	6.77	6.50
740.1	770.1	7.12	6.78	6.50
800.1	830.1	7.17	6.70	6.34
840.1	870.1	7.29	6.65	6.31
900.1	930.1	7.80	6.87	6.41
940.1	970.1	8.17	7.15	6.54
1000.1	1030.1	8.53	7.51	6.75
1040.1	1070.1	8.69	7.70	6.85
1100.1	1130.1	8.91	8.04	7.06
1140.1	1170.1	8.88	8.05	7.10
1200.1	1230.1	8.75	7.95	7.12
1240.1	1270.1	8.66	7.87	7.03
1300.1	1330.1	8.45	7.65	6.74
1340.1	1370.1	8.12	7.29	6.37
1400.1	1430.1	7.81	6.88	6.23
1440.1	1470.1	7.68	6.74	6.26
1500.1	1530.1	7.45	6.74	6.43
1540.1	1570.1	7.38	6.82	6.59
1600.1	1630.1	7.48	7.01	6.88
1640.1	1670.1	7.56	7.15	7.01
1700.1	1730.1	7.75	7.37	7.26
1740.1	1770.1	7.86	7.45	7.38
1800.1	1830.1	7.96	7.57	7.53
1840.1	1870.1	8.13	7.68	7.57
1900.1	1930.1	8.34	7.81	7.68
1940.1	1970.1	8.62	7.96	7.79
2000.1	2030.1	8.96	8.29	8.13
2040.1	2070.1	9.48	8.70	8.42
2100.1	2130.1	9.87	9.15	8.93
2140.1	2170.1	10.40	9.55	9.28
2200.1	2230.1	10.80	10.05	9.80

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm) @LO (dBm)		
		+14	+17	+20
160.1	190.1	3.93	16.84	22.73
220.1	250.1	13.86	21.35	30.50
280.1	310.1	20.09	27.00	30.60
340.1	370.1	21.94	28.10	31.19
400.1	430.1	25.19	28.33	30.03
460.1	490.1	30.46	30.61	31.74
520.1	550.1	28.61	30.31	30.37
580.1	610.1	26.23	25.79	28.03
640.1	670.1	26.79	26.45	30.85
700.1	730.1	26.66	27.33	26.22
740.1	770.1	23.90	28.75	29.16
800.1	830.1	22.12	37.50	29.46
840.1	870.1	21.04	28.76	32.94
900.1	930.1	23.86	23.87	26.12
940.1	970.1	19.06	24.65	24.48
1000.1	1030.1	16.82	24.13	24.47
1040.1	1070.1	16.22	19.57	25.28
1100.1	1130.1	16.14	17.45	22.81
1140.1	1170.1	16.50	17.57	21.36
1200.1	1230.1	17.17	18.45	20.43
1240.1	1270.1	16.78	17.60	19.42
1300.1	1330.1	15.71	16.44	18.89
1340.1	1370.1	15.63	17.47	19.82
1400.1	1430.1	16.91	21.08	21.15
1440.1	1470.1	19.82	20.66	22.23
1500.1	1530.1	21.08	21.64	23.27
1540.1	1570.1	20.78	22.43	23.62
1600.1	1630.1	22.03	23.42	23.77
1640.1	1670.1	22.15	23.94	24.12
1700.1	1730.1	20.20	24.13	25.28
1740.1	1770.1	19.34	24.35	25.40
1800.1	1830.1	18.45	24.09	25.79
1840.1	1870.1	17.95	23.82	26.22
1900.1	1930.1	17.35	23.71	25.67
1940.1	1970.1	16.85	22.36	25.72
2000.1	2030.1	16.51	22.23	25.38
2040.1	2070.1	16.23	21.41	26.03
2100.1	2130.1	16.07	21.23	26.26
2140.1	2170.1	16.40	19.79	25.08
2200.1	2230.1	16.82	20.08	23.90

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+14dBm (dB) @LO (dBm)		
		+14	+17	+20
160.1	190.1	-12.20	-1.45	0.13
220.1	250.1	-2.46	0.09	0.08
280.1	310.1	0.08	0.21	0.07
340.1	370.1	0.61	0.19	0.07
400.1	430.1	0.59	0.19	0.08
460.1	490.1	0.57	0.16	0.10
520.1	550.1	0.58	0.22	0.11
580.1	610.1	0.44	0.24	0.17
640.1	670.1	0.56	0.20	0.18
700.1	730.1	0.74	0.30	0.23
740.1	770.1	0.84	0.35	0.27
800.1	830.1	1.15	0.69	0.52
840.1	870.1	1.13	0.83	0.63
900.1	930.1	0.90	0.89	0.75
940.1	970.1	0.74	0.93	0.89
1000.1	1030.1	0.65	0.87	0.99
1040.1	1070.1	0.58	0.76	1.04
1100.1	1130.1	0.47	0.64	1.05
1140.1	1170.1	0.55	0.67	1.06
1200.1	1230.1	0.78	0.88	1.16
1240.1	1270.1	0.88	0.90	1.25
1300.1	1330.1	1.27	1.17	1.51
1340.1	1370.1	1.50	1.42	1.69
1400.1	1430.1	1.95	1.85	1.74
1440.1	1470.1	2.03	1.83	1.58
1500.1	1530.1	2.08	1.65	1.36
1540.1	1570.1	2.14	1.51	1.20
1600.1	1630.1	2.04	1.25	0.96
1640.1	1670.1	1.95	1.08	0.81
1700.1	1730.1	2.06	0.99	0.73
1740.1	1770.1	2.21	1.04	0.71
1800.1	1830.1	2.40	1.11	0.72
1840.1	1870.1	2.62	1.31	0.85
1900.1	1930.1	2.92	1.55	0.98
1940.1	1970.1	3.13	1.77	1.12
2000.1	2030.1	3.25	1.83	1.22
2040.1	2070.1	3.34	1.90	1.25
2100.1	2130.1	3.27	1.73	1.19
2140.1	2170.1	3.34	1.74	1.17
2200.1	2230.1	3.25	1.50	0.98

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=700.1MHz (dB) @LO (dBm) +17
300.0	400.1	5.91
284.7	415.4	6.01
269.5	430.6	6.05
254.2	445.9	6.14
238.9	461.2	6.17
223.7	476.4	6.24
208.4	491.7	6.22
193.2	506.9	6.29
177.9	522.2	6.31
162.6	537.5	6.36
147.4	552.7	6.39
132.1	568.0	6.38
116.8	583.3	6.39
101.6	598.5	6.41
86.3	613.8	6.46
71.1	629.0	6.43
55.8	644.3	6.56
40.5	659.6	6.63
25.3	674.8	6.69
10.0	690.1	6.75
10.0	710.1	6.77
24.5	724.6	6.77
39.0	739.1	6.79
53.5	753.6	6.82
68.0	768.1	6.77
82.5	782.6	6.85
97.0	797.1	6.78
111.5	811.6	6.74
126.0	826.1	6.78
140.5	840.6	6.79
155.0	855.1	6.80
169.5	869.6	6.77
184.0	884.1	6.84
198.5	898.6	6.93
213.0	913.1	7.04
227.5	927.6	7.18
242.0	942.1	7.29
256.5	956.6	7.55
285.5	985.6	7.71
300.0	1000.1	7.82

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=400.1MHz (dB) @LO (dBm) +17
10.0	410.1	6.73
22.6	422.7	6.72
35.1	435.2	6.74
47.7	447.8	6.76
60.3	460.4	6.86
72.8	472.9	6.86
85.4	485.5	6.86
97.9	498.0	6.88
110.5	510.6	6.84
123.1	523.2	6.90
135.6	535.7	6.96
148.2	548.3	6.96
160.8	560.9	7.04
173.3	573.4	7.06
185.9	586.0	7.07
198.5	598.6	7.17
211.0	611.1	7.17
223.6	623.7	7.19
236.2	636.3	7.30
248.7	648.8	7.33
261.3	661.4	7.43
273.8	673.9	7.49
286.4	686.5	7.43
299.0	699.1	7.48
311.5	711.6	7.49
324.1	724.2	7.46
336.7	736.8	7.53
349.2	749.3	7.47
361.8	761.9	7.49
374.4	774.5	7.55
386.9	787.0	7.44
399.5	799.6	7.40
412.1	812.2	7.41
424.6	824.7	7.35
437.2	837.3	7.43
449.7	849.8	7.42
462.3	862.4	7.39
474.9	875.0	7.47
487.4	887.5	7.50
500.0	900.1	7.59

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1000.1MHz (dB) @LO (dBm) +17
500.0	500.1	5.44
487.4	512.7	5.51
474.9	525.2	5.72
462.3	537.8	5.85
449.7	550.4	5.93
437.2	562.9	5.99
424.6	575.5	6.02
412.1	588.0	6.06
399.5	600.6	6.07
386.9	613.2	6.10
374.4	625.7	6.16
361.8	638.3	6.14
349.2	650.9	6.19
336.7	663.4	6.29
324.1	676.0	6.29
311.5	688.6	6.30
299.0	701.1	6.32
286.4	713.7	6.36
273.8	726.3	6.42
261.3	738.8	6.43
248.7	751.4	6.46
236.2	763.9	6.53
223.6	776.5	6.51
211.0	789.1	6.52
198.5	801.6	6.56
185.9	814.2	6.52
173.3	826.8	6.54
160.8	839.3	6.60
148.2	851.9	6.57
135.6	864.5	6.56
123.1	877.0	6.56
110.5	889.6	6.55
97.9	902.2	6.64
85.4	914.7	6.60
72.8	927.3	6.67
60.3	939.8	6.81
47.7	952.4	6.82
35.1	965.0	6.97
22.6	977.5	7.08
10.0	990.1	7.16

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+14	+17	+20	+14	+17	+20
160.1	45.18	44.42	43.34	34.72	35.10	36.81
220.1	44.81	42.46	41.26	30.11	32.39	36.93
280.1	42.54	40.33	39.68	27.03	31.18	34.96
340.1	38.73	38.39	38.69	26.37	30.46	33.64
400.1	36.36	36.73	37.44	25.92	29.36	32.26
460.1	35.07	35.96	36.74	24.70	27.82	30.90
520.1	33.73	35.18	36.29	24.15	27.27	29.95
580.1	32.66	34.17	35.71	23.04	26.48	29.56
640.1	32.30	33.68	34.86	22.22	24.91	27.90
700.1	32.04	33.75	35.00	22.34	24.73	26.89
740.1	31.62	33.34	34.48	22.40	24.77	26.47
800.1	31.12	32.86	34.19	23.15	25.73	27.20
840.1	30.61	32.19	33.39	23.43	26.36	27.83
900.1	30.29	31.80	33.02	22.99	27.74	29.74
940.1	29.85	31.66	33.29	22.20	27.16	29.87
1000.1	29.12	30.44	31.80	22.29	25.72	29.46
1040.1	29.06	30.38	32.05	22.80	25.28	28.75
1100.1	28.99	30.15	31.37	24.15	26.06	28.63
1140.1	29.04	30.41	31.55	25.15	26.59	28.40
1200.1	29.52	31.27	32.81	27.83	28.31	28.84
1240.1	30.17	32.20	34.13	30.35	29.65	28.77
1300.1	31.55	34.33	36.89	33.17	30.28	27.53
1340.1	32.84	36.29	37.42	30.84	28.29	25.04
1400.1	35.21	38.44	36.83	25.91	24.29	21.38
1440.1	37.58	38.85	36.77	23.12	21.72	19.46
1500.1	39.96	40.96	38.99	19.60	18.73	17.27
1540.1	39.62	41.43	39.83	17.54	16.94	15.82
1600.1	35.35	38.77	40.21	14.94	14.88	14.20
1640.1	33.55	36.66	38.48	13.32	13.38	12.87
1700.1	30.45	32.68	33.55	11.69	11.79	11.55
1740.1	29.33	30.93	31.16	10.90	11.01	10.70
1800.1	27.73	28.69	28.46	10.33	9.89	9.77
1840.1	26.97	27.35	26.97	9.92	9.25	9.13
1900.1	25.51	25.47	25.16	9.87	8.63	8.40
1940.1	24.41	24.15	23.60	9.34	8.22	7.77
2000.1	22.96	22.72	22.29	9.26	7.81	7.30
2040.1	21.97	21.72	21.36	8.78	7.56	7.04
2100.1	20.71	20.49	20.33	8.86	7.23	6.76
2140.1	19.56	19.42	19.44	8.07	6.84	6.50
2200.1	18.44	18.40	18.35	7.92	6.53	6.06

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB) @LO (dBm)		
		+14	+17	+20
160.1	190.1	44.46	44.25	42.66
220.1	250.1	37.81	40.36	39.94
280.1	310.1	39.78	38.21	38.15
340.1	370.1	38.56	37.45	37.49
400.1	430.1	37.69	37.51	37.34
460.1	490.1	37.03	37.35	38.03
520.1	550.1	38.47	38.49	37.98
580.1	610.1	37.00	35.66	34.51
640.1	670.1	35.19	35.17	34.60
700.1	730.1	36.72	37.63	39.07
740.1	770.1	39.92	42.01	45.33
800.1	830.1	38.65	38.09	36.44
840.1	870.1	32.74	31.70	31.09
900.1	930.1	28.97	27.01	26.69
940.1	970.1	26.89	25.33	24.50
1000.1	1030.1	24.11	23.21	22.31
1040.1	1070.1	22.90	22.21	21.51
1100.1	1130.1	20.96	20.43	19.95
1140.1	1170.1	19.94	19.51	19.23
1200.1	1230.1	18.86	18.18	17.58
1240.1	1270.1	18.48	17.52	16.91
1300.1	1330.1	18.37	17.27	17.55
1340.1	1370.1	18.68	17.98	19.02
1400.1	1430.1	19.58	19.34	20.28
1440.1	1470.1	20.22	19.93	20.72
1500.1	1530.1	21.19	21.14	21.87
1540.1	1570.1	22.17	22.33	23.15
1600.1	1630.1	23.61	24.12	25.23
1640.1	1670.1	24.56	25.36	26.71
1700.1	1730.1	28.01	28.23	29.02
1740.1	1770.1	32.57	30.97	29.20
1800.1	1830.1	30.27	30.27	26.58
1840.1	1870.1	27.32	26.06	24.26
1900.1	1930.1	23.74	21.32	20.79
1940.1	1970.1	22.03	19.94	19.74
2000.1	2030.1	18.97	17.28	17.29
2040.1	2070.1	17.88	16.23	16.44
2100.1	2130.1	15.55	14.35	14.80
2140.1	2170.1	14.93	13.59	14.24
2200.1	2230.1	13.43	12.44	13.35

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1) @LO (dBm)		
		+14	+17	+20
160.1	190.1	5.75	3.79	2.85
220.1	250.1	3.86	2.77	2.46
280.1	310.1	2.94	2.45	2.32
340.1	370.1	2.69	2.37	2.26
400.1	430.1	2.48	2.29	2.20
460.1	490.1	2.40	2.26	2.18
520.1	550.1	2.36	2.23	2.16
580.1	610.1	2.28	2.15	2.07
640.1	670.1	2.23	2.13	2.05
700.1	730.1	2.14	2.07	2.01
740.1	770.1	2.09	2.02	1.97
800.1	830.1	2.03	1.96	1.91
840.1	870.1	2.02	1.94	1.90
900.1	930.1	1.99	1.89	1.84
940.1	970.1	1.97	1.86	1.80
1000.1	1030.1	1.92	1.81	1.73
1040.1	1070.1	1.85	1.73	1.64
1100.1	1130.1	1.73	1.62	1.49
1140.1	1170.1	1.63	1.51	1.38
1200.1	1230.1	1.46	1.34	1.20
1240.1	1270.1	1.35	1.22	1.07
1300.1	1330.1	1.24	1.13	1.15
1340.1	1370.1	1.22	1.20	1.33
1400.1	1430.1	1.34	1.45	1.62
1440.1	1470.1	1.47	1.64	1.81
1500.1	1530.1	1.70	1.91	2.09
1540.1	1570.1	1.84	2.06	2.26
1600.1	1630.1	2.00	2.24	2.48
1640.1	1670.1	2.09	2.32	2.59
1700.1	1730.1	2.25	2.46	2.73
1740.1	1770.1	2.33	2.51	2.77
1800.1	1830.1	2.50	2.65	2.86
1840.1	1870.1	2.59	2.69	2.87
1900.1	1930.1	2.79	2.81	2.94
1940.1	1970.1	2.92	2.87	2.94
2000.1	2030.1	3.15	3.05	3.09
2040.1	2070.1	3.35	3.19	3.20
2100.1	2130.1	3.55	3.38	3.39
2140.1	2170.1	3.74	3.52	3.55
2200.1	2230.1	3.87	3.70	3.82

LO (MHz)	LO VSWR (:1) @LO (dBm)		
	+14	+17	+20
160.1	52.65	42.38	16.72
220.1	30.49	11.53	6.30
280.1	16.41	6.37	4.57
340.1	7.05	3.90	3.84
400.1	4.00	3.08	3.48
460.1	3.02	2.69	3.30
520.1	2.35	2.53	3.33
580.1	2.02	2.38	3.23
640.1	1.85	2.36	3.27
700.1	1.74	2.40	3.35
740.1	1.68	2.39	3.35
800.1	1.64	2.42	3.42
840.1	1.63	2.41	3.40
900.1	1.70	2.50	3.50
940.1	1.76	2.57	3.56
1000.1	1.86	2.69	3.70
1040.1	1.92	2.76	3.78
1100.1	1.99	2.83	3.84
1140.1	2.05	2.89	3.92
1200.1	2.12	2.93	3.95
1240.1	2.18	2.99	4.00
1300.1	2.22	2.97	3.94
1340.1	2.27	2.99	3.95
1400.1	2.26	2.90	3.81
1440.1	2.28	2.92	3.85
1500.1	2.33	2.92	3.79
1540.1	2.46	3.03	3.88
1600.1	2.69	3.09	3.81
1640.1	2.88	3.20	3.86
1700.1	3.23	3.27	3.80
1740.1	3.44	3.38	3.83
1800.1	3.83	3.47	3.76
1840.1	3.90	3.53	3.76
1900.1	4.19	3.58	3.67
1940.1	4.15	3.58	3.62
2000.1	4.39	3.60	3.54
2040.1	4.28	3.61	3.52
2100.1	4.46	3.64	3.43
2140.1	4.24	3.58	3.38
2200.1	4.34	3.62	3.33

IF (OUT) (MHz)	IF VSWR @LO=1000.1MHz (:1) @LO (dBm)		
	+14	+17	+20
10.1	2.60	1.88	1.49
22.4	2.69	1.92	1.51
34.6	2.58	1.80	1.44
46.9	2.58	1.83	1.48
59.1	2.55	1.83	1.48
71.4	2.52	1.80	1.48
83.6	2.59	1.85	1.50
95.9	2.62	1.86	1.52
108.1	2.67	1.90	1.55
120.4	2.60	1.87	1.54
132.6	2.64	1.91	1.56
144.9	2.57	1.87	1.52
157.1	2.55	1.85	1.51
169.4	2.50	1.82	1.49
181.6	2.53	1.85	1.52
193.9	2.61	1.91	1.57
206.1	2.57	1.90	1.56
218.4	2.58	1.91	1.56
230.6	2.50	1.85	1.52
242.9	2.46	1.83	1.51
255.1	2.47	1.84	1.52
267.4	2.50	1.87	1.54
279.6	2.56	1.91	1.58
291.9	2.53	1.90	1.57
304.1	2.51	1.89	1.56
316.4	2.54	1.91	1.57
328.6	2.49	1.88	1.55
340.9	2.50	1.90	1.57
353.1	2.49	1.90	1.58
365.4	2.49	1.89	1.57
377.6	2.47	1.87	1.55
389.9	2.44	1.86	1.55
402.1	2.47	1.89	1.57
414.4	2.48	1.90	1.58
426.6	2.46	1.89	1.58
438.9	2.47	1.89	1.57
451.1	2.38	1.83	1.53
463.4	2.38	1.83	1.53
487.9	2.43	1.88	1.58
500.1	2.42	1.88	1.57

Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	+0	26	2	22	3	37	28	53	26	66
1	-	29	+0	42	14	26	38	40	32	59	42	56
2	93	56	39	62	42	56	39	55	41	57	53	71
3	>100	62	59	63	56	65	50	63	65	67	66	76
4	>100	86	74	86	74	88	69	80	71	79	71	80
5	>100	>92	>92	>92	88	>92	82	>92	82	89	87	>92
6	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
7	>100	>92	>92	>92	>92	>92	>92	>92	>92	>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
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 700.1 MHz; -1.00 dBm.**
LO IN: 730.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -8.04 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	12	33	14	35	16	46	34	55	36	71
1	-	32	+0	37	14	29	37	39	42	63	58	64
2	72	46	31	54	31	51	30	47	32	68	52	68
3	>100	46	41	51	45	50	36	48	51	58	46	71
4	>100	68	57	62	49	80	51	58	49	60	53	64
5	>100	72	74	68	55	61	52	63	50	61	66	64
6	>100	82	67	87	70	73	60	76	56	67	57	66
7	>100	93	76	91	85	77	83	77	78	72	66	71
8	>100	98	83	88	89	86	71	83	68	82	71	73
9	>100	>102	>102	97	95	97	87	83	79	80	76	78
10	>100	>102	>102	>102	101	91	95	93	85	84	83	84
RF CAL		0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

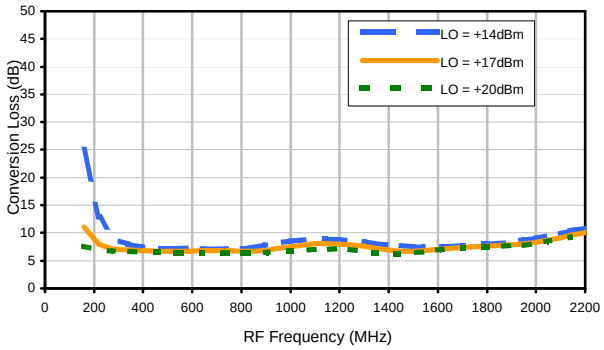
Test conditions: **RF IN: 700.1 MHz; 9.00 dBm.**
LO IN: 730.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 1.97 dBm

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.

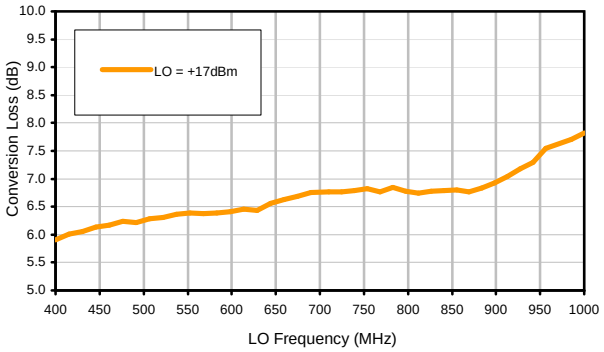
Frequency Mixer ADE-10H

Typical Performance Curves

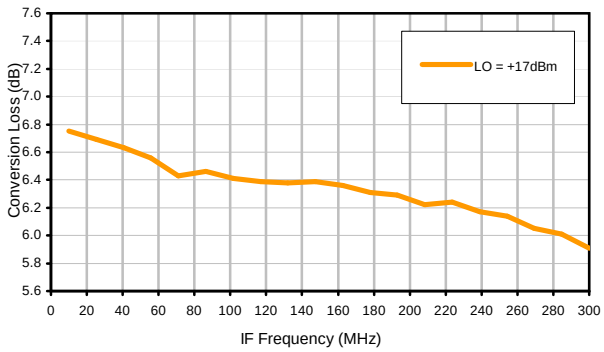
Conversion Loss @ IF=30MHz



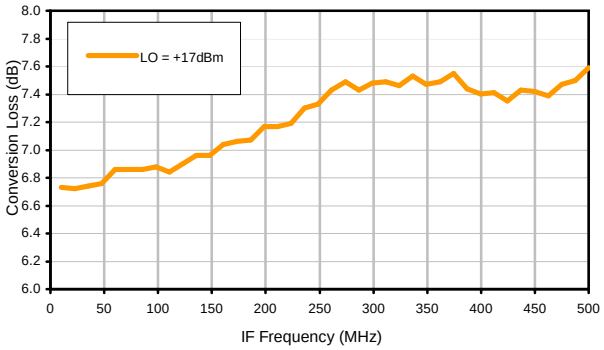
Conversion Loss vs. LO @ RF=700.1MHz



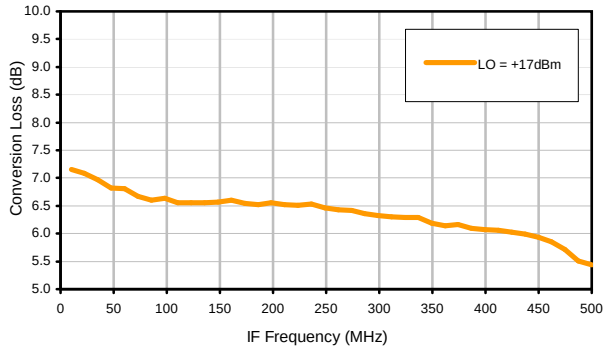
Conversion Loss vs. IF @ RF=700.1MHz



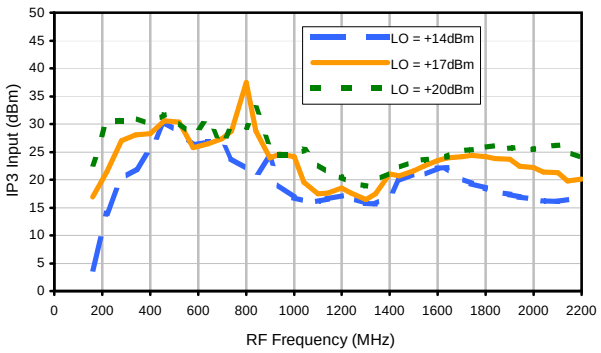
Conversion Loss vs. IF @ RF=400.1MHz



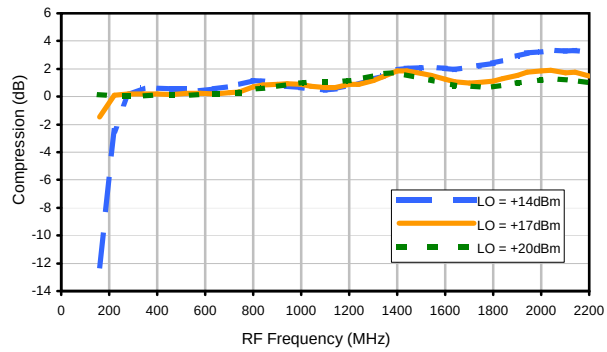
Conversion Loss vs. IF @ RF=1000.1MHz



IP3 Input

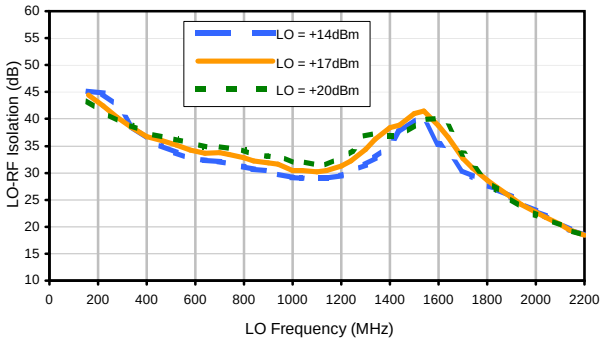


Compression @ RF IN=+14dBm

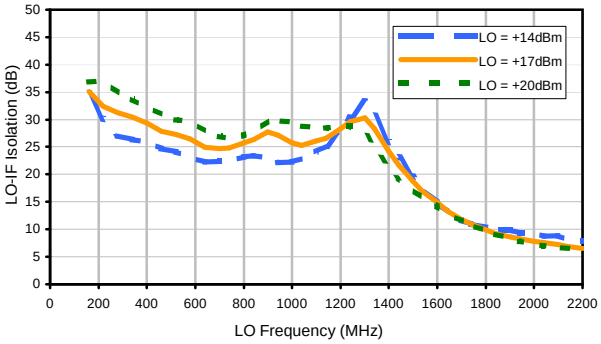


Typical Performance Curves

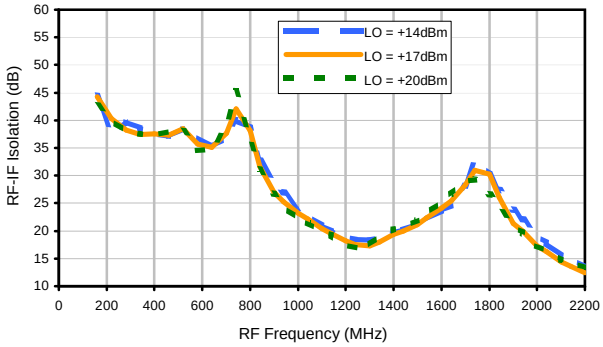
LO-RF Isolation



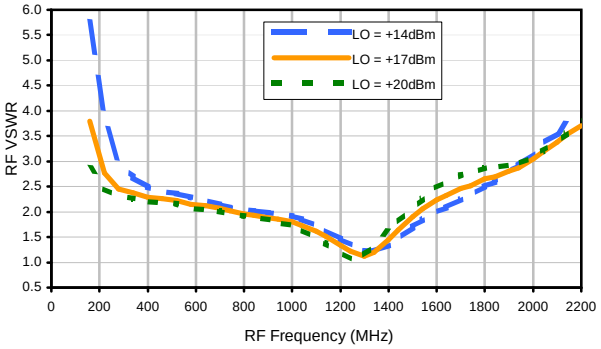
LO-IF Isolation



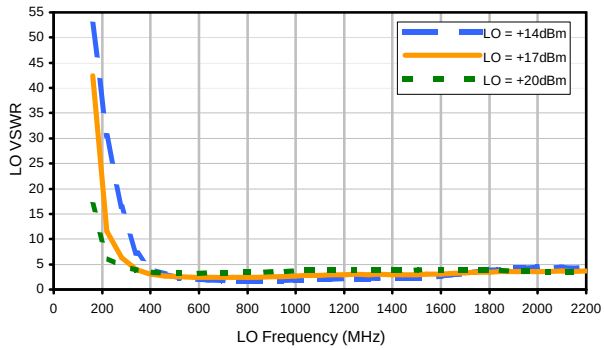
RF-IF Isolation



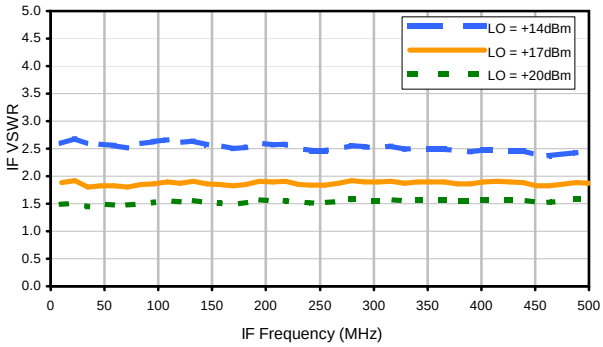
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	+0	26	2	22	3	37	28	53	26	66
1	-	29	+0	42	14	26	38	40	32	59	42	56
2	93	56	39	62	42	56	39	55	41	57	53	71
3	>100	62	59	63	56	65	50	63	65	67	66	76
4	>100	86	74	86	74	88	69	80	71	79	71	80
5	>100	>92	>92	>92	88	>92	82	>92	82	89	87	>92
6	>100	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92	>92
7	>100	>92	>92	>92	>92	>92	>92	>92	>92	>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
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions: **RF IN: 700.1 MHz; -1.00 dBm.**
LO IN: 730.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; -8.04 dBm

RF HARMONICS ORDER	(-dBm)	(-dBc)										
0	-	-	12	33	14	35	16	46	34	55	36	71
1	-	32	+0	37	14	29	37	39	42	63	58	64
2	72	46	31	54	31	51	30	47	32	68	52	68
3	>100	46	41	51	45	50	36	48	51	58	46	71
4	>100	68	57	62	49	80	51	58	49	60	53	64
5	>100	72	74	68	55	61	52	63	50	61	66	64
6	>100	82	67	87	70	73	60	76	56	67	57	66
7	>100	93	76	91	85	77	83	77	78	72	66	71
8	>100	98	83	88	89	86	71	83	68	82	71	73
9	>100	>102	>102	97	95	97	87	83	79	80	76	78
10	>100	>102	>102	>102	101	91	95	93	85	84	83	84
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

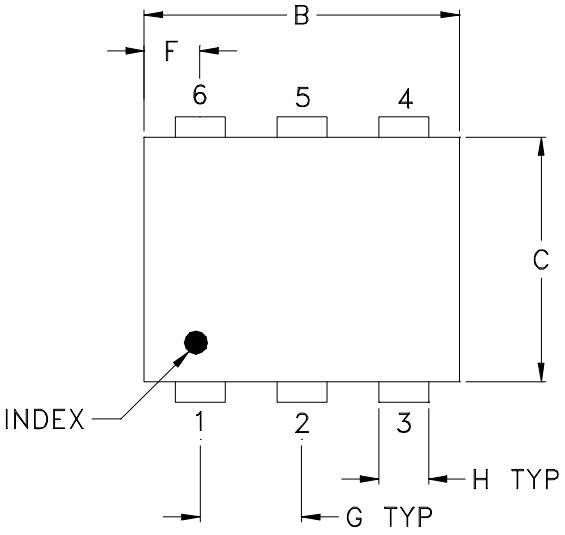
Test conditions: **RF IN: 700.1 MHz; 9.00 dBm.**
LO IN: 730.01 MHz; +17.00 dBm
IF OUT: 29.91 MHz; 1.97 dBm

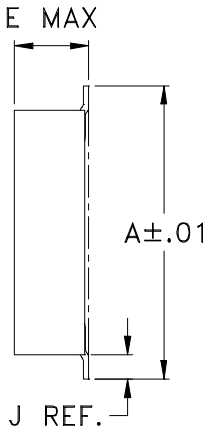
Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Case Style CD

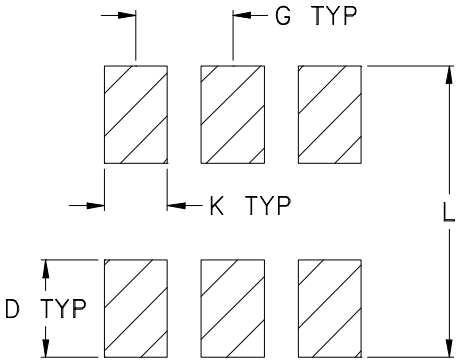
CD541
CD542
CD636
CD637

Outline Dimensions





PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE#	A	B	C	D	E	F	G	H	J	K	L	WT, GRAM
CD541	.272 (6.91)	.310 (7.87)	.220 (5.58)	.100 (2.54)	.082 (2.08)	.055 (1.40)	.100 (2.54)	.030 (0.76)	.026 (0.66)	.065 (1.65)	.300 (7.62)	.15
CD542					.112 (2.84)							.20
CD636					.162 (4.11)							.25
CD637					.206 (5.23)							.40

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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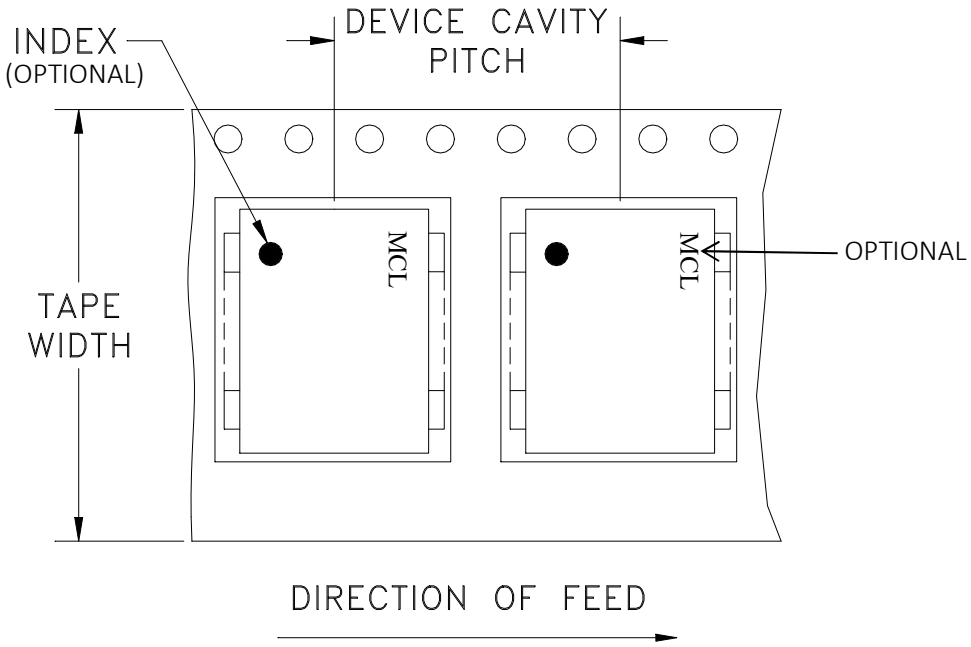
Tape & Reel Packaging TR-F34

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
16	12	7	Small quantity standard (see note)	20
				50
				100
				200
		13	Standard	500
				1000

Note: Availability of small reel quantity varies by model.
Refer to pricing and availability on individual model dashboard.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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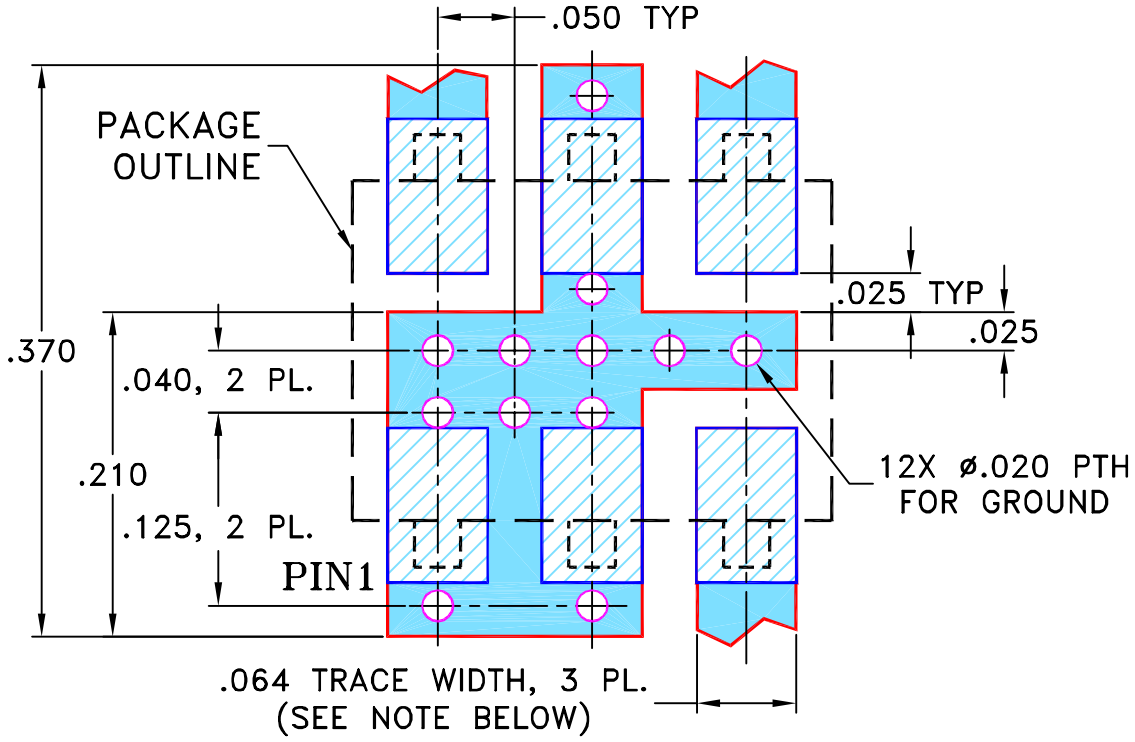
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82272	NEW RELEASE	08/05/02	MMG	DJ
A	M102713	ADDED NOTE 2 & "...WITH SMOBC"	01/17/06	MMG	IL

SUGGESTED MOUNTING CONFIGURATION FOR CD541/542/636/637 CASE STYLES, "jv", "ju", "jw" PIN CONNECTIONS



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	MMG	07/17/02
TOLERANCES ON:	CHECKED	WL	08/02/02
2 PL DECIMALS ±	APPROVED	DJ	08/05/02
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

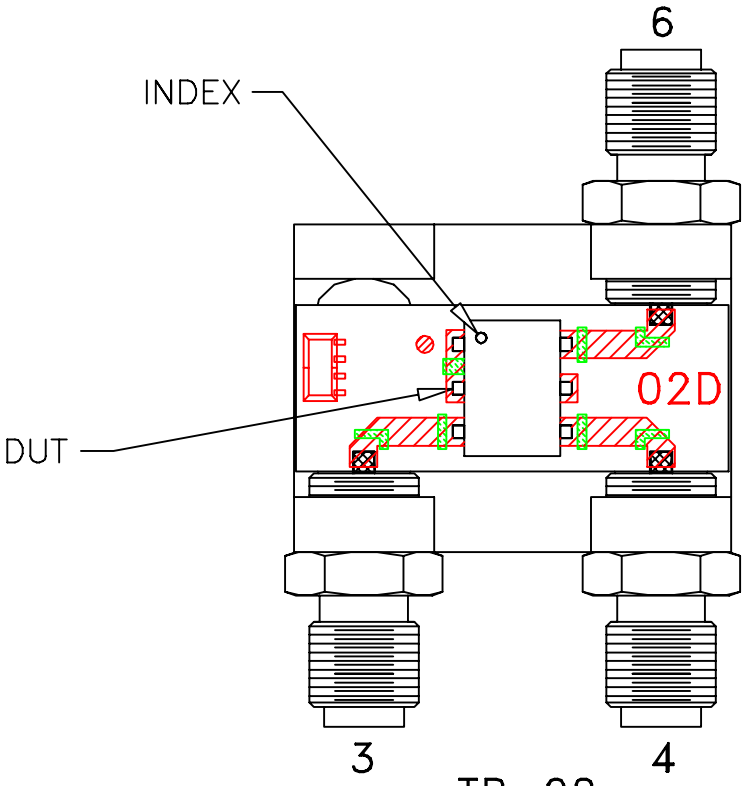
PL, jv/ju/jw, CD541/542/636/637, ADE, TB-02

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-051	A

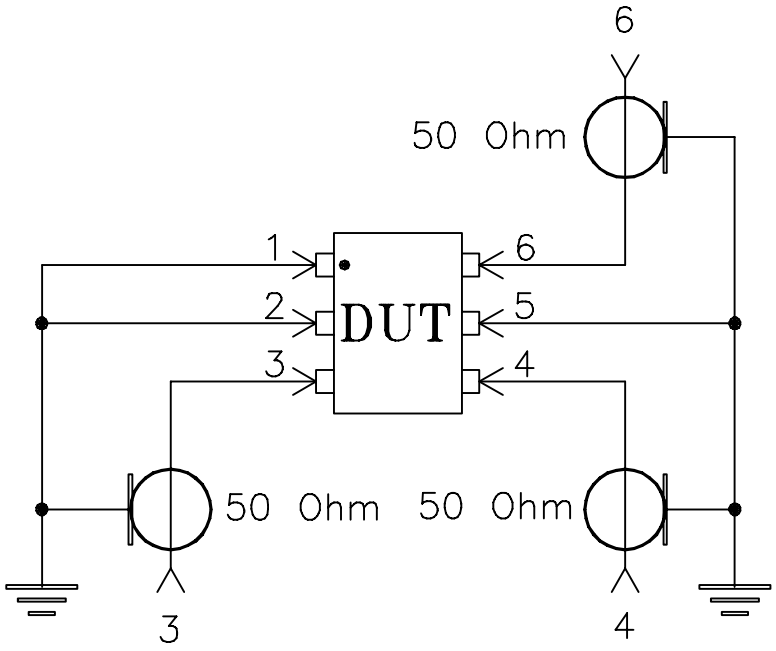
FILE:	SCALE:	SHEET:
98PL051	8:1	1 OF 1

Evaluation Board and Circuit

For Pin Connections refer to Data Sheet of the DUT



TB-02



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

Mini-Circuits®

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Environmental Specifications ENV02T1

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 Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
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
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