

# Surface Mount Frequency Mixer

## ADE-3GL+

Level 7 (LO Power +7 dBm) 2100 to 2600 MHz

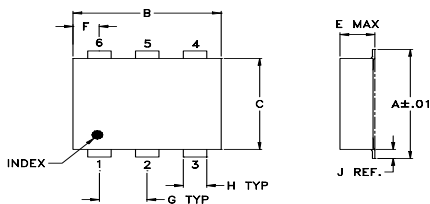
### Maximum Ratings

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.	

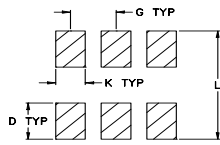
### Pin Connections

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

### Outline Drawing



### PCB Land Pattern

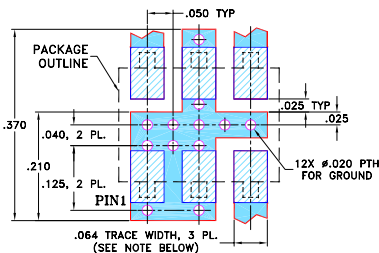


Suggested Layout,  
Tolerance to be within ±.002

### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	
.272	.310	.220	.100	.082	.055	.100	
6.91	7.87	5.59	2.54	2.08	1.40	2.54	
H	J	K	L				wt
.030	.026	.065	.300				grams
0.76	0.66	1.65	7.62				0.15

### Demo Board MCL P/N: TB-02 Suggested PCB Layout (PL-051)



- 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

### 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.  
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### Features

- low conversion loss, 6.0 dB typ.
- good L-R isolation, 34 dB typ.
- low profile package
- aqueous washable
- low cost
- protected by U.S. Patent 6,133,525

### Applications

- PCMCIA cards
- ISM



Generic photo used for illustration purposes only  
CASE STYLE: CD541

### +RoHS Compliant

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



Available Tape and Reel  
at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200
13"	500, 1000

### Electrical Specifications

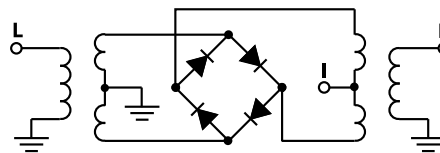
FREQUENCY (MHz)		CONVERSION LOSS (dB)			LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)		IP3 at center band (dBm)
LO/RF	IF	$\bar{X}$	$\sigma$	Max.	Typ.	Min.	Typ.	Min.	Typ.
2100-2600	DC-600	6.0	0.25	8.8	34	25	20	7	17

1 dB COMP.: +1 dBm typ.

### 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 +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
2015.79	2045.79	5.55	36.00	12.90	2.04	1.52
2121.05	2151.05	5.41	35.10	15.00	1.94	1.48
2226.32	2256.32	5.57	34.30	17.50	2.23	1.40
2300.00	2330.00	5.86	34.50	19.40	2.46	1.39
2320.00	2350.00	5.98	34.50	19.90	2.55	1.39
2331.58	2361.58	5.94	34.50	20.20	2.61	1.39
2350.00	2380.00	5.96	34.60	20.70	2.68	1.39
2380.00	2410.00	5.96	34.40	21.60	2.84	1.39
2400.00	2430.00	6.06	34.30	22.10	2.88	1.40
2430.00	2460.00	6.05	34.10	23.00	3.01	1.40
2436.84	2466.84	6.10	34.00	23.20	3.01	1.40
2450.00	2480.00	6.01	33.90	23.60	3.06	1.41
2480.00	2510.00	6.03	33.80	24.70	3.16	1.41
2500.00	2530.00	6.02	33.80	25.70	3.21	1.44
2530.00	2560.00	6.03	33.50	26.80	3.26	1.46
2542.11	2572.11	6.20	33.60	27.30	3.16	1.48
2550.00	2580.00	6.07	33.60	27.80	3.32	1.50
2580.00	2610.00	6.00	33.50	28.70	3.32	1.51
2600.00	2630.00	6.10	33.40	28.90	3.32	1.51
2630.00	2660.00	6.15	33.20	28.70	3.44	1.56

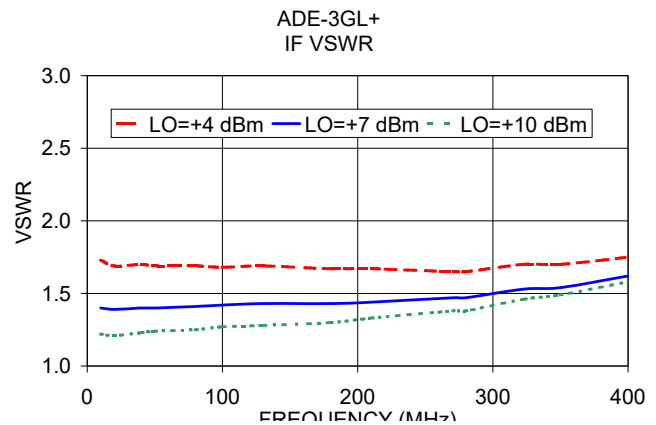
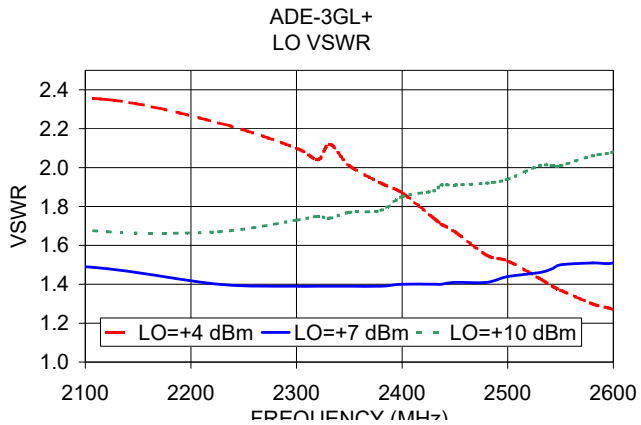
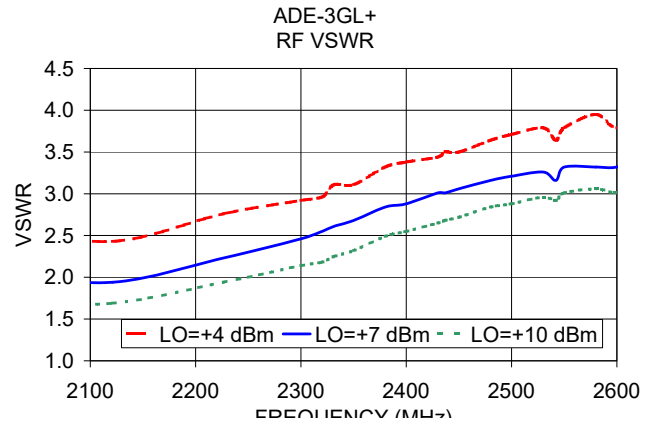
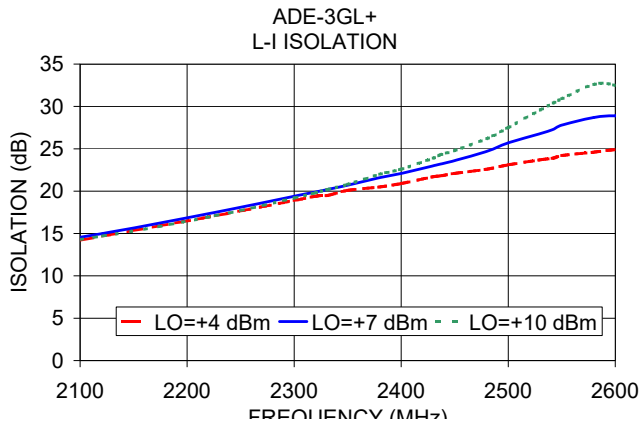
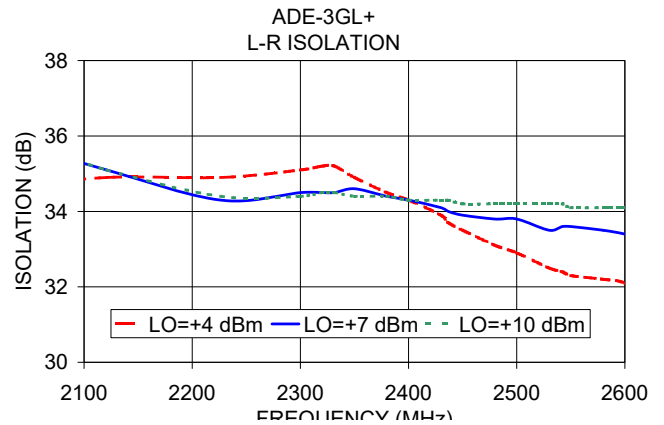
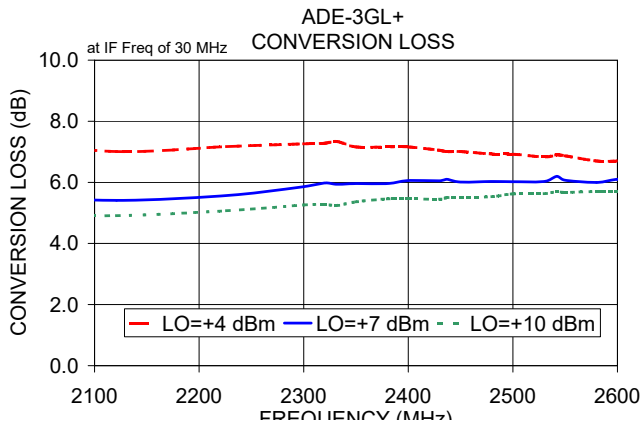
### Electrical Schematic



**Mini-Circuits**

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M151107  
ADE-3GL+  
WL/TD/CP/AM  
200420  
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# Frequency Mixer

# ADE-3GL+

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)		
		@LO (dBm)		
		+4	+7	+10
1620.0	1650.0	41.18	10.97	6.07
1680.0	1710.0	28.32	7.59	5.56
1740.0	1770.0	17.14	6.75	5.47
1800.0	1830.0	11.51	6.72	5.65
1860.0	1890.0	8.68	6.32	5.46
1920.0	1950.0	8.13	6.51	5.72
1980.0	2010.0	7.63	6.36	5.64
2040.0	2070.0	7.10	6.06	5.45
2100.0	2130.0	7.04	6.20	5.63
2160.0	2190.0	6.89	6.12	5.63
2220.0	2250.0	6.88	6.06	5.57
2280.0	2310.0	7.22	6.30	5.78
2320.0	2350.0	7.18	6.16	5.59
2380.0	2410.0	7.92	6.72	6.03
2420.0	2450.0	7.97	6.75	6.01
2480.0	2510.0	8.49	7.24	6.42
2520.0	2550.0	8.36	7.14	6.40
2580.0	2610.0	8.59	7.42	6.74
2620.0	2650.0	8.48	7.33	6.73
2680.0	2710.0	8.65	7.47	6.88
2720.0	2750.0	8.57	7.46	6.92
2780.0	2810.0	8.63	7.55	7.00
2820.0	2850.0	8.57	7.59	7.08
2880.0	2910.0	8.72	7.68	7.15
2920.0	2950.0	8.77	7.83	7.36
2980.0	3010.0	8.79	7.69	7.24
3020.0	3050.0	8.94	7.88	7.41
3080.0	3110.0	8.93	7.65	7.15
3120.0	3150.0	9.13	7.81	7.33
3180.0	3210.0	9.29	7.67	7.20
3220.0	3250.0	9.69	7.89	7.44
3280.0	3310.0	9.89	7.67	7.22
3320.0	3350.0	10.71	8.01	7.50
3380.0	3410.0	11.14	7.82	7.29
3420.0	3450.0	12.50	8.22	7.55
3480.0	3510.0	13.61	8.11	7.35
3520.0	3550.0	17.08	8.74	7.62
3580.0	3610.0	18.76	8.86	7.49
3620.0	3650.0	23.18	9.85	7.83
3680.0	3710.0	25.09	10.38	7.87

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+4	+7	+10
1620.0	1650.0	-13.50	4.72	14.52
1680.0	1710.0	-10.37	10.64	13.43
1740.0	1770.0	-4.19	10.23	13.00
1800.0	1830.0	6.53	10.17	19.10
1860.0	1890.0	8.13	12.47	17.39
1920.0	1950.0	12.01	15.17	18.08
1980.0	2010.0	18.77	17.56	20.51
2040.0	2070.0	14.52	17.28	18.63
2100.0	2130.0	12.87	16.83	17.37
2160.0	2190.0	12.13	15.32	16.27
2220.0	2250.0	11.79	14.54	15.53
2280.0	2310.0	12.17	14.38	16.37
2320.0	2350.0	11.65	14.40	17.69
2380.0	2410.0	13.49	16.50	21.75
2420.0	2450.0	13.50	16.51	19.68
2480.0	2510.0	14.62	16.62	19.22
2520.0	2550.0	13.21	16.74	17.58
2580.0	2610.0	13.49	16.96	17.91
2620.0	2650.0	12.79	16.83	18.17
2680.0	2710.0	12.48	16.67	19.28
2720.0	2750.0	13.47	16.36	18.16
2780.0	2810.0	12.67	16.44	19.11
2820.0	2850.0	13.05	16.29	17.66
2880.0	2910.0	12.17	16.20	16.89
2920.0	2950.0	13.50	16.60	16.77
2980.0	3010.0	11.41	15.59	15.76
3020.0	3050.0	12.37	16.06	16.46
3080.0	3110.0	10.31	15.48	18.79
3120.0	3150.0	10.45	15.19	25.85
3180.0	3210.0	8.98	16.47	20.22
3220.0	3250.0	9.10	16.50	21.78
3280.0	3310.0	7.87	16.06	20.59
3320.0	3350.0	7.68	15.60	21.68
3380.0	3410.0	7.59	15.00	20.39
3420.0	3450.0	8.38	14.11	20.55
3480.0	3510.0	9.62	13.06	20.73
3520.0	3550.0	5.32	12.23	18.58
3580.0	3610.0	2.16	11.67	17.85
3620.0	3650.0	-1.45	11.21	16.43
3680.0	3710.0	-2.65	11.06	16.23

RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+1dBm (dB)		
		@LO (dBm)		
		+4	+7	+10
1620.0	1650.0	-27.10	-1.37	0.35
1680.0	1710.0	-15.99	0.54	0.35
1740.0	1770.0	-6.06	0.84	0.33
1800.0	1830.0	-0.94	0.59	0.20
1860.0	1890.0	0.78	0.33	0.17
1920.0	1950.0	0.76	0.09	0.03
1980.0	2010.0	0.73	0.07	-0.01
2040.0	2070.0	0.86	0.14	0.06
2100.0	2130.0	0.84	0.10	0.00
2160.0	2190.0	0.96	0.19	0.05
2220.0	2250.0	0.99	0.18	0.06
2280.0	2310.0	0.86	0.12	0.05
2320.0	2350.0	0.97	0.20	0.12
2380.0	2410.0	0.75	0.11	0.07
2420.0	2450.0	0.73	0.14	0.09
2480.0	2510.0	0.65	0.07	0.03
2520.0	2550.0	0.71	0.02	0.03
2580.0	2610.0	0.73	-0.04	-0.04
2620.0	2650.0	0.79	0.01	-0.03
2680.0	2710.0	0.76	0.00	-0.04
2720.0	2750.0	0.75	-0.01	-0.01
2780.0	2810.0	0.75	-0.01	-0.01
2820.0	2850.0	0.67	-0.01	0.00
2880.0	2910.0	0.79	0.00	-0.01
2920.0	2950.0	0.66	-0.01	0.01
2980.0	3010.0	0.79	0.01	0.01
3020.0	3050.0	0.67	0.02	0.04
3080.0	3110.0	0.84	0.09	0.10
3120.0	3150.0	0.83	0.09	0.09
3180.0	3210.0	0.94	0.15	0.09
3220.0	3250.0	0.97	0.13	0.08
3280.0	3310.0	0.96	0.19	0.09
3320.0	3350.0	0.80	0.18	0.07
3380.0	3410.0	0.61	0.24	0.08
3420.0	3450.0	0.22	0.29	0.08
3480.0	3510.0	-0.47	0.36	0.08
3520.0	3550.0	-2.13	0.47	0.08
3580.0	3610.0	-3.31	0.53	0.07
3620.0	3650.0	-5.83	0.53	0.09
3680.0	3710.0	-6.99	0.51	0.10

# Frequency Mixer

# ADE-3GL+

## Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2339.89MHz (dB)
		@LO (dBm) +7
160.1	2500.0	7.6
180.1	2520.0	7.7
200.1	2540.0	7.7
220.1	2560.0	7.7
240.1	2580.0	7.8
260.1	2600.0	7.7
280.1	2620.0	7.9
300.1	2640.0	7.8
320.1	2660.0	7.8
340.1	2680.0	7.7
360.1	2700.0	7.7
380.1	2720.0	7.7
400.1	2740.0	7.6
420.1	2760.0	7.7
440.1	2780.0	7.5
460.1	2800.0	7.5
480.1	2820.0	7.5
500.1	2840.0	7.4
520.1	2860.0	7.5
540.1	2880.0	7.4
560.1	2900.0	7.5
580.1	2920.0	7.5
600.1	2940.0	7.5
620.1	2960.0	7.5
640.1	2980.0	7.6
660.1	3000.0	7.7
680.1	3020.0	7.7
700.1	3040.0	7.7
720.1	3060.0	7.9
740.1	3080.0	7.9
760.1	3100.0	8.1
780.1	3120.0	8.1
820.1	3160.0	8.4
840.1	3180.0	8.6
880.1	3220.0	8.9
900.1	3240.0	9.0
940.1	3280.0	9.5
960.1	3300.0	9.7
1000.1	3340.0	10.1
1020.1	3360.0	10.6

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2089.89MHz (dB)
		@LO (dBm) +7
10.1	2100.0	6.27
30.1	2120.0	6.30
50.1	2140.0	6.27
70.1	2160.0	6.27
90.1	2180.0	6.14
110.1	2200.0	6.16
130.1	2220.0	6.22
150.1	2240.0	6.12
170.1	2260.0	6.12
190.1	2280.0	5.97
210.1	2300.0	6.01
230.1	2320.0	5.92
250.1	2340.0	5.85
270.1	2360.0	5.78
290.1	2380.0	5.66
310.1	2400.0	5.67
330.1	2420.0	5.61
350.1	2440.0	5.59
390.1	2480.0	5.56
410.1	2500.0	5.71
450.1	2540.0	5.78
470.1	2560.0	5.75
510.1	2600.0	5.96
530.1	2620.0	6.03
570.1	2660.0	6.20
590.1	2680.0	6.38
630.1	2720.0	6.64
650.1	2740.0	6.75
690.1	2780.0	7.07
710.1	2800.0	7.24
750.1	2840.0	7.53
770.1	2860.0	7.69
810.1	2900.0	7.98
830.1	2920.0	8.16
870.1	2960.0	8.54
890.1	2980.0	8.68
930.1	3020.0	9.09
950.1	3040.0	9.29
990.1	3080.0	9.72
1010.1	3100.0	9.96

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2610.1MHz (dB)
		@LO (dBm) +7
910.1	1700.0	10.68
890.1	1720.0	10.35
870.1	1740.0	10.08
850.1	1760.0	9.74
830.1	1780.0	9.51
810.1	1800.0	9.28
790.1	1820.0	9.13
770.1	1840.0	8.96
750.1	1860.0	8.78
730.1	1880.0	8.58
710.1	1900.0	8.46
690.1	1920.0	8.27
670.1	1940.0	8.19
650.1	1960.0	8.01
630.1	1980.0	7.89
610.1	2000.0	7.76
590.1	2020.0	7.66
570.1	2040.0	7.55
550.1	2060.0	7.47
530.1	2080.0	7.38
510.1	2100.0	7.40
490.1	2120.0	7.40
470.1	2140.0	7.43
450.1	2160.0	7.48
430.1	2180.0	7.60
410.1	2200.0	7.70
390.1	2220.0	7.73
370.1	2240.0	7.86
330.1	2280.0	8.01
310.1	2300.0	8.01
270.1	2340.0	8.05
250.1	2360.0	8.02
210.1	2400.0	7.87
190.1	2420.0	7.85
150.1	2460.0	7.66
130.1	2480.0	7.63
90.1	2520.0	7.46
70.1	2540.0	7.39
30.1	2580.0	7.33
10.1	2600.0	7.35

# Frequency Mixer

# ADE-3GL+

## Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+4	+7	+10	+4	+7	+10
1650.0	26.10	26.87	28.52	7.47	7.58	8.56
1710.0	26.65	27.63	29.19	7.14	7.49	8.54
1770.0	27.16	28.18	29.71	6.89	7.79	8.70
1830.0	27.51	28.63	30.00	7.02	8.19	8.90
1890.0	27.61	29.25	31.00	7.62	8.68	9.22
1950.0	27.86	30.02	32.16	8.37	9.18	9.50
2010.0	28.26	30.91	33.49	9.32	9.83	9.91
2070.0	28.83	31.89	34.96	10.39	10.38	10.17
2130.0	29.28	32.64	36.09	11.40	11.09	10.64
2190.0	29.68	33.41	37.38	12.56	11.74	11.02
2250.0	29.47	33.44	37.72	13.56	12.30	11.56
2310.0	29.40	33.22	37.49	14.45	12.93	11.91
2350.0	29.13	32.88	37.02	15.08	13.35	12.28
2410.0	28.91	32.30	35.98	15.74	14.00	12.76
2450.0	28.73	32.10	35.60	15.90	14.34	13.17
2510.0	28.53	31.74	34.91	16.10	14.59	13.76
2550.0	28.57	31.76	34.74	16.20	14.83	14.01
2610.0	28.65	31.74	34.49	16.46	15.36	14.52
2650.0	28.70	31.76	34.36	16.56	15.67	14.95
2710.0	28.71	31.68	34.16	16.92	16.31	15.57
2750.0	28.87	31.69	33.90	17.16	16.78	16.16
2810.0	29.04	31.80	33.82	17.63	17.64	17.21
2850.0	29.30	31.79	33.40	18.06	18.28	18.10
2910.0	29.52	31.75	32.83	19.00	19.45	19.53
2950.0	29.81	31.55	32.10	19.85	20.50	20.70
3010.0	30.12	31.04	31.30	21.50	22.15	22.88
3050.0	30.29	30.62	30.37	22.98	23.76	24.52
3110.0	30.68	30.10	29.51	26.03	26.72	27.63
3150.0	30.76	29.65	28.73	29.13	29.74	30.39
3210.0	30.94	29.12	28.08	38.26	38.13	35.64
3250.0	30.76	28.79	27.31	40.90	42.91	34.85
3310.0	30.65	28.38	26.78	29.58	31.42	29.71
3350.0	30.24	27.97	26.35	25.91	27.59	27.06
3410.0	29.58	27.51	26.10	22.28	23.80	23.93
3450.0	28.96	27.17	25.82	20.42	21.88	22.47
3510.0	27.83	26.51	25.21	18.36	19.69	20.43
3550.0	27.35	26.11	24.97	17.27	18.39	19.31
3610.0	26.25	25.22	24.23	16.02	17.00	17.92
3650.0	25.75	24.73	23.98	15.41	16.14	17.19
3710.0	25.04	24.23	23.58	14.72	15.34	16.30

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+4	+7	+10
1620.0	1650.0	20.57	22.48	25.48
1680.0	1710.0	21.69	25.12	27.95
1740.0	1770.0	24.10	27.69	29.81
1800.0	1830.0	26.99	29.93	31.45
1860.0	1890.0	31.12	32.53	33.71
1920.0	1950.0	33.72	35.33	36.11
1980.0	2010.0	36.95	38.13	39.78
2040.0	2070.0	37.62	39.77	42.45
2100.0	2130.0	39.99	41.82	41.09
2160.0	2190.0	41.20	40.90	42.95
2220.0	2250.0	40.48	39.74	41.35
2280.0	2310.0	39.74	41.42	41.95
2320.0	2350.0	38.94	39.41	41.23
2380.0	2410.0	37.93	39.56	39.92
2420.0	2450.0	37.15	37.78	38.05
2480.0	2510.0	36.40	36.10	35.98
2520.0	2550.0	36.70	36.31	35.87
2580.0	2610.0	36.99	36.94	35.68
2620.0	2650.0	37.76	36.36	35.63
2680.0	2710.0	38.64	37.29	36.40
2720.0	2750.0	40.67	38.34	36.64
2780.0	2810.0	41.04	40.77	38.57
2820.0	2850.0	41.87	39.69	38.95
2880.0	2910.0	43.88	42.81	43.12
2920.0	2950.0	46.86	45.04	41.41
2980.0	3010.0	49.46	45.11	43.89
3020.0	3050.0	50.47	45.55	45.68
3080.0	3110.0	53.97	50.45	48.56
3120.0	3150.0	53.50	52.10	50.22
3180.0	3210.0	55.85	56.97	56.76
3220.0	3250.0	52.42	57.03	60.39
3280.0	3310.0	49.04	54.78	63.02
3320.0	3350.0	46.85	52.21	62.46
3380.0	3410.0	44.68	49.93	68.77
3420.0	3450.0	43.17	48.64	53.84
3480.0	3510.0	41.23	47.82	54.65
3520.0	3550.0	40.12	47.27	50.27
3580.0	3610.0	39.56	43.39	52.16
3620.0	3650.0	38.44	42.43	46.87
3680.0	3710.0	36.78	40.02	46.49

# Frequency Mixer

# ADE-3GL+

## Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=2600MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+4	+7	+10		+4	+7	+10		+4	+7	+10
1620.0	1650.0	13.49	5.23	2.79	1650.0	4.60	4.25	3.24	10.0	2.32	1.78	1.46
1680.0	1710.0	10.43	3.46	2.30	1710.0	4.09	3.34	2.98	30.0	2.26	1.76	1.46
1740.0	1770.0	6.68	2.84	2.10	1770.0	3.39	2.70	2.81	50.0	2.27	1.77	1.47
1800.0	1830.0	4.41	2.67	2.17	1830.0	2.77	2.38	2.82	70.0	2.25	1.75	1.47
1860.0	1890.0	3.19	2.44	2.10	1890.0	2.10	2.19	2.78	90.0	2.23	1.73	1.45
1920.0	1950.0	2.84	2.35	2.06	1950.0	1.69	2.11	2.82	110.0	2.21	1.72	1.45
1980.0	2010.0	2.57	2.20	1.96	2010.0	1.52	2.12	2.88	130.0	2.24	1.76	1.48
2040.0	2070.0	2.30	2.02	1.83	2070.0	1.49	2.14	2.88	150.0	2.24	1.75	1.48
2100.0	2130.0	2.21	1.98	1.82	2130.0	1.65	2.22	2.92	170.0	2.22	1.73	1.47
2160.0	2190.0	2.20	1.99	1.85	2190.0	1.87	2.31	2.92	190.0	2.18	1.69	1.45
2220.0	2250.0	2.21	1.98	1.84	2250.0	2.15	2.38	2.88	210.0	2.17	1.70	1.47
2280.0	2310.0	2.35	2.08	1.92	2310.0	2.44	2.45	2.82	230.0	2.15	1.70	1.47
2320.0	2350.0	2.37	2.07	1.90	2350.0	2.67	2.48	2.75	250.0	2.14	1.67	1.45
2380.0	2410.0	2.64	2.28	2.06	2410.0	3.04	2.60	2.74	270.0	2.08	1.64	1.43
2420.0	2450.0	2.82	2.45	2.22	2450.0	3.33	2.67	2.71	290.0	2.06	1.63	1.43
2480.0	2510.0	3.30	2.91	2.65	2510.0	3.78	2.86	2.77	310.0	2.03	1.62	1.44
2520.0	2550.0	3.46	3.09	2.86	2550.0	3.93	2.86	2.72	330.0	2.00	1.58	1.42
2580.0	2610.0	3.78	3.41	3.18	2610.0	4.14	2.87	2.66	350.0	1.94	1.55	1.41
2620.0	2650.0	3.86	3.50	3.30	2650.0	4.11	2.77	2.55	390.0	1.85	1.51	1.41
2680.0	2710.0	4.08	3.69	3.47	2710.0	4.20	2.71	2.42	410.0	1.81	1.48	1.39
2720.0	2750.0	4.11	3.73	3.54	2750.0	4.00	2.57	2.31	450.0	1.72	1.45	1.41
2780.0	2810.0	4.33	3.93	3.73	2810.0	4.03	2.49	2.21	470.0	1.68	1.44	1.44
2820.0	2850.0	4.35	3.99	3.79	2850.0	3.76	2.36	2.13	510.0	1.60	1.45	1.49
2880.0	2910.0	4.48	4.09	3.86	2910.0	3.83	2.31	2.06	530.0	1.57	1.44	1.51
2920.0	2950.0	4.52	4.13	3.91	2950.0	3.53	2.21	2.01	570.0	1.52	1.49	1.61
2980.0	3010.0	4.59	4.13	3.90	3010.0	3.70	2.19	1.94	590.0	1.53	1.56	1.70
3020.0	3050.0	4.64	4.17	3.90	3050.0	3.50	2.14	1.92	630.0	1.54	1.66	1.83
3080.0	3110.0	4.63	4.05	3.77	3110.0	3.83	2.24	1.95	650.0	1.57	1.73	1.93
3120.0	3150.0	4.75	4.12	3.84	3150.0	3.81	2.29	2.03	690.0	1.65	1.89	2.13
3180.0	3210.0	4.78	4.04	3.76	3210.0	4.25	2.47	2.14	710.0	1.70	1.97	2.23
3220.0	3250.0	5.03	4.20	3.89	3250.0	4.32	2.56	2.21	750.0	1.88	2.23	2.53
3280.0	3310.0	5.10	4.13	3.82	3310.0	4.72	2.72	2.28	770.0	1.97	2.36	2.65
3320.0	3350.0	5.61	4.37	3.99	3350.0	4.96	2.86	2.36	810.0	2.12	2.56	2.91
3380.0	3410.0	5.72	4.27	3.87	3410.0	5.27	3.04	2.44	830.0	2.25	2.73	3.08
3420.0	3450.0	6.49	4.55	4.05	3450.0	5.72	3.30	2.56	870.0	2.52	3.05	3.43
3480.0	3510.0	6.86	4.54	3.96	3510.0	5.83	3.53	2.71	890.0	2.64	3.19	3.60
3520.0	3550.0	8.51	5.06	4.23	3550.0	6.24	3.93	2.90	930.0	2.92	3.52	3.95
3580.0	3610.0	8.81	5.17	4.25	3610.0	6.39	4.31	3.18	950.0	3.05	3.67	4.09
3620.0	3650.0	10.75	5.99	4.67	3650.0	6.61	4.80	3.47	990.0	3.27	3.91	4.34
3680.0	3710.0	10.62	6.24	4.82	3710.0	6.76	5.17	3.82	1010.0	3.43	4.07	4.51

# Frequency Mixer

# ADE-3GL+

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	28	5	36	33	47	19	55	43	61
1	-	33	0	48	39	39	41	50	49	52	52	68
2	57	72	50	53	50	72	60	62	64	84	51	72
3	62	105	90	96	68	84	74	82	70	80	76	73
4	88	84	91	100	87	95	93	114	92	106	79	84
5	111	89	87	88	85	92	91	82	101	91	85	92
6	101	81	85	84	86	83	88	96	89	96	90	87
7	107	86	93	82	86	94	90	84	100	85	87	85
8	96	66	83	81	84	82	86	88	84	89	87	84
9	103	72	73	75	89	94	81	88	86	85	86	86
10	101	70	77	73	87	90	89	98	92	91	82	87
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 2350 MHz; -14 dBm.  
 LO IN: 2380 MHz; +7 dBm  
 IF OUT: 30 MHz; -20.43 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	4	39	16	42	45	60	37	77	56	80
1	-	32	0	47	38	39	46	54	56	58	61	81
2	57	63	41	44	40	68	50	61	58	77	48	80
3	62	63	59	71	52	67	55	67	55	67	63	75
4	88	70	73	84	67	76	73	74	63	66	75	81
5	111	93	73	85	90	90	66	91	74	83	66	86
6	101	99	93	85	96	100	86	93	85	89	82	79
7	107	99	100	98	84	109	97	102	88	97	94	102
8	96	81	100	95	95	95	100	98	98	98	101	104
9	103	91	82	95	95	93	99	97	96	92	93	101
10	101	92	91	82	96	95	92	91	99	92	97	93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 2350 MHz; -4 dBm.  
 LO IN: 2380 MHz; +7 dBm  
 IF OUT: 30 MHz; -10.46 dBm

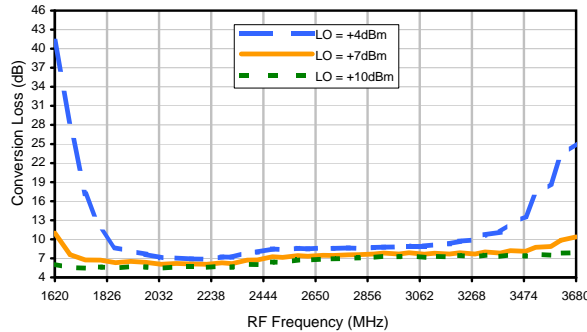
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
 2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
 3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

# Frequency Mixer

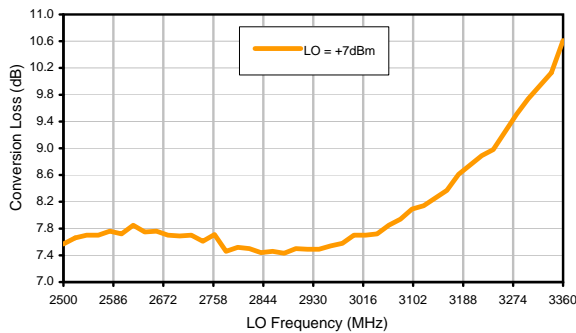
# ADE-3GL+

## Typical Performance Curves

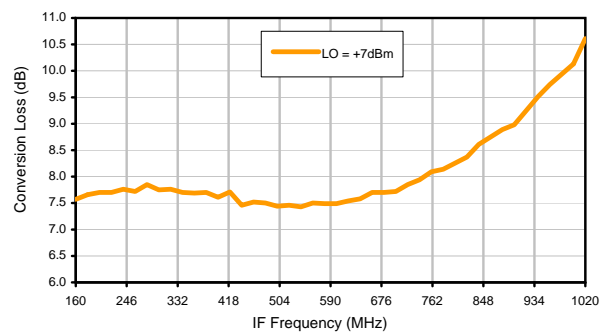
Conversion Loss @ IF=30MHz



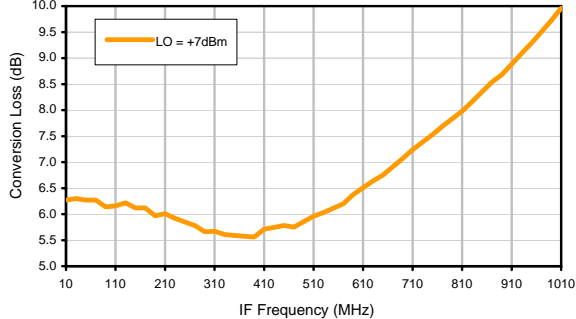
Conversion Loss vs. LO @ RF=2339.89MHz



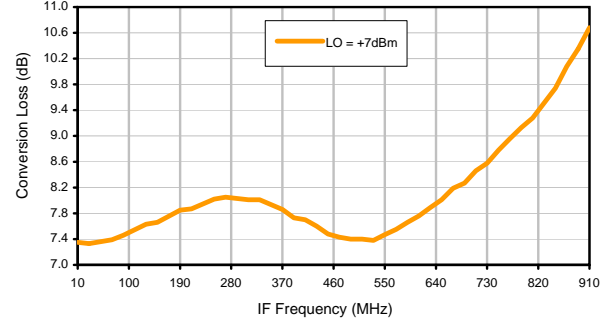
Conversion Loss vs. IF @ RF=2339.89MHz



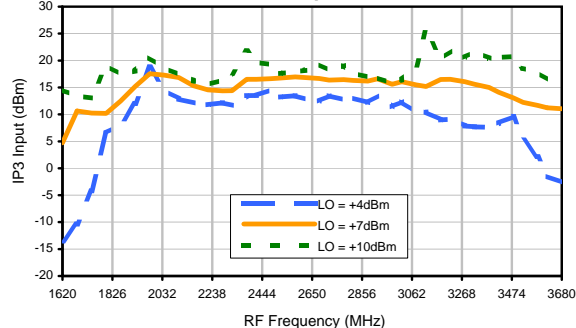
Conversion Loss vs. IF @ RF=2089.89MHz



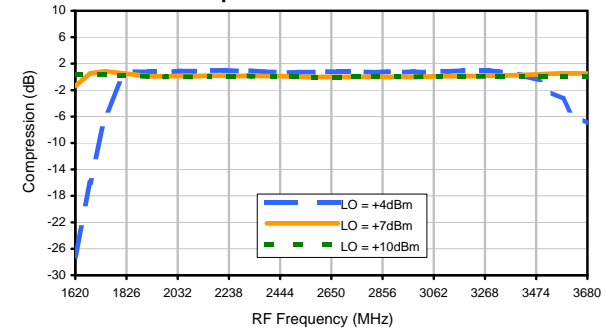
Conversion Loss vs. IF @ RF=2610.1MHz



IP3 Input



Compression @ RF IN=+1dBm

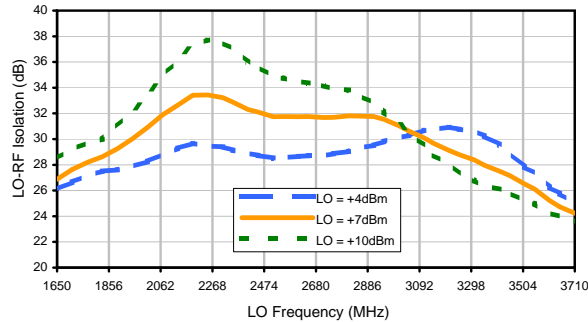


# Frequency Mixer

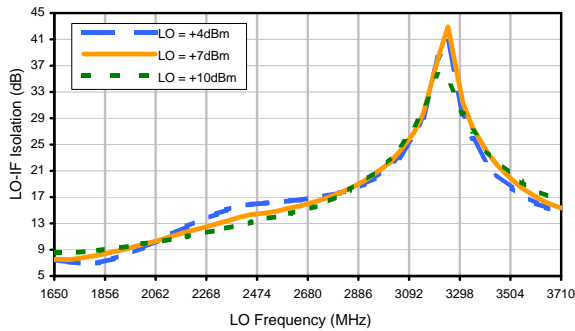
# ADE-3GL+

## Typical Performance Curves

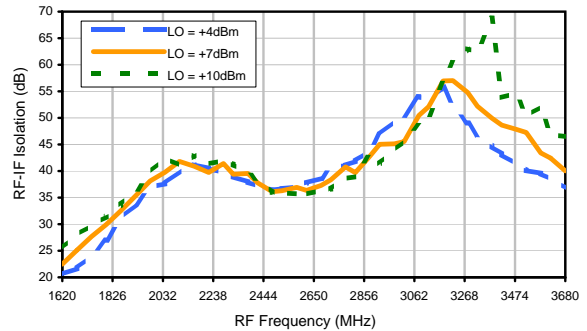
LO-RF Isolation



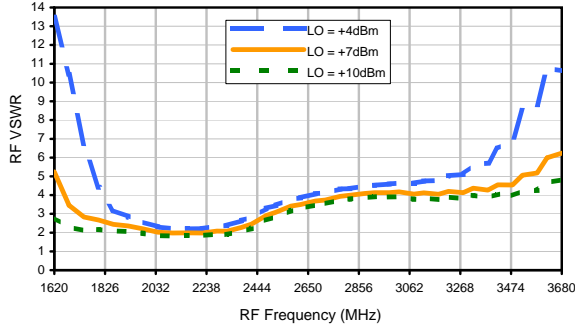
LO-IF Isolation



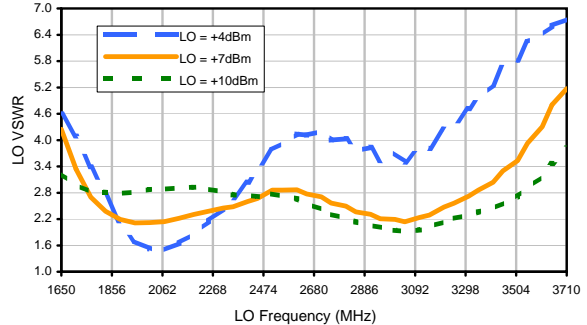
RF-IF Isolation



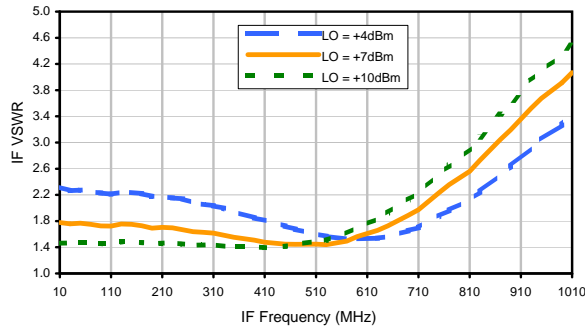
RF VSWR



LO VSWR



IF VSWR



# Frequency Mixer

# ADE-3GL+

## Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	14	28	5	36	33	47	19	55	43	61
1	-	33	0	48	39	39	41	50	49	52	52	68
2	57	72	50	53	50	72	60	62	64	84	51	72
3	62	105	90	96	68	84	74	82	70	80	76	73
4	88	84	91	100	87	95	93	114	92	106	79	84
5	111	89	87	88	85	92	91	82	101	91	85	92
6	101	81	85	84	86	83	88	96	89	96	90	87
7	107	86	93	82	86	94	90	84	100	85	87	85
8	96	66	83	81	84	82	86	88	84	89	87	84
9	103	72	73	75	89	94	81	88	86	85	86	86
10	101	70	77	73	87	90	89	98	92	91	82	87
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 2350 MHz; -14 dBm.  
 LO IN: 2380 MHz; +7 dBm  
 IF OUT: 30 MHz; -20.43 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	4	39	16	42	45	60	37	77	56	80
1	-	32	0	47	38	39	46	54	56	58	61	81
2	57	63	41	44	40	68	50	61	58	77	48	80
3	62	63	59	71	52	67	55	67	55	67	63	75
4	88	70	73	84	67	76	73	74	63	66	75	81
5	111	93	73	85	90	90	66	91	74	83	66	86
6	101	99	93	85	96	100	86	93	85	89	82	79
7	107	99	100	98	84	109	97	102	88	97	94	102
8	96	81	100	95	95	95	100	98	98	98	101	104
9	103	91	82	95	95	93	99	97	96	92	93	101
10	101	92	91	82	96	95	92	91	99	92	97	93
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

### LO HARMONICS ORDER

Test conditions: RF IN: 2350 MHz; -4 dBm.  
 LO IN: 2380 MHz; +7 dBm  
 IF OUT: 30 MHz; -10.46 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  $\pm .002$

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

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

### Notes:

- Case material: Plastic.
- 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



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.

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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 R04350B 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 <b>MMG</b>	07/17/02
TOLERANCES ON:	CHECKED <b>WL</b>	08/02/02
2 PL DECIMALS ±	APPROVED <b>DJ</b>	08/05/02
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

**Mini-Circuits®** 13 Neptune Avenue  
 Brooklyn NY 11235

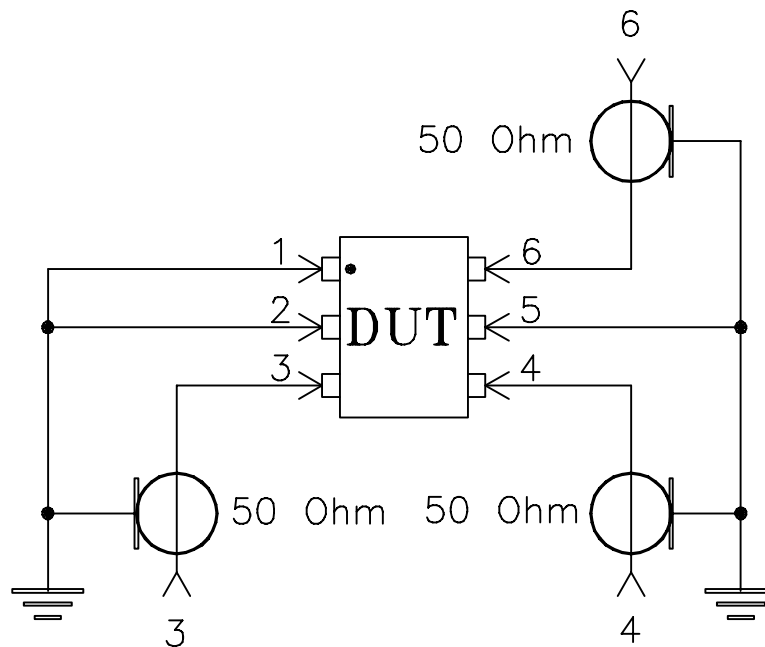
PL, jv/ju/jw, CD541/542/636/637, ADE, TB-02

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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-051	REV: A
FILE: 98PL051	SCALE: 8:1	SHEET: 1 OF 1	

# Evaluation Board and Circuit

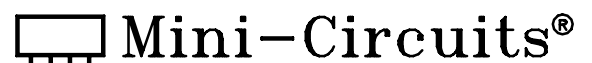
For Pin Connections refer to Data Sheet of the DUT



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.



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