

Frequency Mixer

SIM-ED12399/13

Level 13 (LO Power + 13 dBm)

Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



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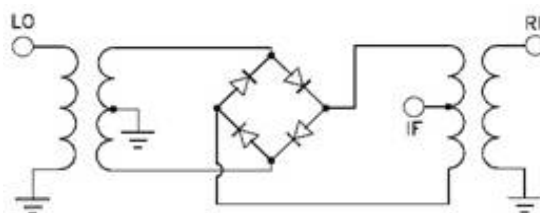
CASE STYLE : HV1195

ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		Min.	Typ.	Max.	Units
Frequency	LO (f _L to f _U)	750		4200	MHz
	RF (f _L to f _U)	750		4200	MHz
	IF	10		1500	MHz
Conversion Loss	Total Range		6.4		dB
LO-RF Isolation			34		dB
LO-IF Isolation			22		dB
Input IP3			+20		dBm
1 dB Compression			+9		dBm

MAXIMUM RATINGS	
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C

PIN CONNECTIONS	
LO	8
RF	4
IF	2
GROUND	1,3,5,6,7

Electrical Schematics



Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB)			RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)			RF (IN) (MHz)	LO (MHz)	COMPRESSION @RF IN=+9dBm (dB)		
		@LO (dBm)					@LO (dBm)					@LO (dBm)		
		+10	+13	+16			+10	+13	+16			+10	+13	+16
670.0	700.0	22.82	13.08	8.11	670.0	700.0	-3.89	2.87	8.31	670.0	700.0	-7.65	-0.78	1.48
770.0	800.0	11.24	7.70	6.50	770.0	800.0	4.40	8.27	15.41	770.0	800.0	2.23	2.73	2.41
870.0	900.0	8.84	7.20	6.41	870.0	900.0	7.67	11.17	14.24	870.0	900.0	2.02	2.51	2.57
970.0	1000.0	7.95	7.14	6.60	970.0	1000.0	10.93	11.74	12.57	970.0	1000.0	1.99	2.01	1.98
1070.0	1100.0	7.01	6.51	6.16	1070.0	1100.0	13.58	16.04	18.10	1070.0	1100.0	2.05	1.88	1.70
1170.0	1200.0	6.57	6.35	6.24	1170.0	1200.0	15.10	16.28	17.12	1170.0	1200.0	1.58	1.33	1.20
1270.0	1300.0	6.53	6.34	6.24	1270.0	1300.0	21.30	16.58	19.04	1270.0	1300.0	1.08	0.80	0.76
1370.0	1400.0	6.45	6.18	6.10	1370.0	1400.0	21.95	25.98	18.62	1370.0	1400.0	0.88	0.63	0.49
1470.0	1500.0	6.38	5.96	5.89	1470.0	1500.0	28.51	18.73	18.03	1470.0	1500.0	0.80	0.67	0.55
1570.0	1600.0	6.41	6.08	5.93	1570.0	1600.0	19.13	19.72	24.16	1570.0	1600.0	0.83	0.62	0.51
1670.0	1700.0	6.45	6.11	5.99	1670.0	1700.0	23.59	19.77	19.10	1670.0	1700.0	0.93	0.62	0.49
1770.0	1800.0	6.65	6.24	6.14	1770.0	1800.0	17.81	19.02	24.63	1770.0	1800.0	0.89	0.66	0.36
1870.0	1900.0	6.44	6.22	6.15	1870.0	1900.0	18.92	26.32	28.84	1870.0	1900.0	1.01	0.59	0.41
1970.0	2000.0	6.66	6.40	6.29	1970.0	2000.0	24.24	23.59	22.30	1970.0	2000.0	0.93	0.60	0.47
2070.0	2100.0	6.65	6.33	6.19	2070.0	2100.0	22.37	21.80	22.61	2070.0	2100.0	0.99	0.72	0.58
2170.0	2200.0	6.84	6.42	6.24	2170.0	2200.0	23.65	20.55	20.48	2170.0	2200.0	1.06	0.87	0.75
2270.0	2300.0	6.80	6.21	5.97	2270.0	2300.0	16.92	17.46	19.29	2270.0	2300.0	1.03	0.86	0.77
2370.0	2400.0	6.28	5.78	5.58	2370.0	2400.0	17.29	17.09	17.87	2370.0	2400.0	1.30	0.97	0.80
2470.0	2500.0	6.78	6.07	5.82	2470.0	2500.0	15.32	24.93	27.25	2470.0	2500.0	1.21	1.02	0.83
2570.0	2600.0	7.21	6.45	6.07	2570.0	2600.0	18.07	14.84	16.44	2570.0	2600.0	1.15	1.11	1.09
2650.0	2680.0	6.59	5.83	5.43	2650.0	2680.0	13.89	15.34	15.23	2650.0	2680.0	1.32	1.38	1.40
2750.0	2780.0	6.40	5.84	5.49	2750.0	2780.0	11.41	11.96	12.59	2750.0	2780.0	1.43	1.32	1.32
2830.0	2860.0	6.03	5.61	5.30	2830.0	2860.0	10.57	11.72	17.21	2830.0	2860.0	1.55	1.33	1.20
2930.0	2960.0	5.87	5.28	5.21	2930.0	2960.0	13.26	19.72	20.77	2930.0	2960.0	1.43	1.01	0.81
3010.0	3040.0	5.47	5.26	5.26	3010.0	3040.0	17.43	20.52	22.17	3010.0	3040.0	1.46	0.70	0.61
3110.0	3140.0	5.47	5.35	5.42	3110.0	3140.0	17.67	19.35	22.20	3110.0	3140.0	1.37	0.52	0.37
3190.0	3220.0	5.53	5.37	5.40	3190.0	3220.0	17.97	20.67	22.28	3190.0	3220.0	1.28	0.47	0.30
3290.0	3320.0	5.64	5.48	5.52	3290.0	3320.0	20.20	23.12	21.85	3290.0	3320.0	1.47	0.81	0.51
3370.0	3400.0	5.96	5.73	5.71	3370.0	3400.0	20.57	21.67	23.31	3370.0	3400.0	1.40	0.84	0.61
3470.0	3500.0	6.45	6.05	5.94	3470.0	3500.0	18.94	23.22	20.67	3470.0	3500.0	1.30	0.88	0.67
3550.0	3580.0	6.80	6.30	6.12	3550.0	3580.0	19.12	23.07	20.89	3550.0	3580.0	1.09	0.79	0.63
3650.0	3680.0	6.95	6.40	6.25	3650.0	3680.0	28.39	24.73	22.48	3650.0	3680.0	0.74	0.54	0.47
3730.0	3760.0	7.22	6.49	6.30	3730.0	3760.0	28.59	22.85	23.42	3730.0	3760.0	0.73	0.57	0.47
3830.0	3860.0	7.42	6.63	6.44	3830.0	3860.0	20.49	22.93	23.05	3830.0	3860.0	1.00	0.70	0.58
3910.0	3940.0	8.33	7.35	7.02	3910.0	3940.0	19.18	20.78	23.14	3910.0	3940.0	0.61	0.59	0.62
4010.0	4040.0	8.68	7.51	7.19	4010.0	4040.0	22.30	19.95	24.70	4010.0	4040.0	0.40	0.38	0.43
4090.0	4120.0	9.09	7.56	7.19	4090.0	4120.0	21.42	18.63	22.89	4090.0	4120.0	0.37	0.32	0.32
4190.0	4220.0	10.05	7.86	7.33	4190.0	4220.0	18.97	22.21	21.49	4190.0	4220.0	0.03	0.30	0.29
4270.0	4300.0	12.60	7.78	7.14	4270.0	4300.0	9.47	24.23	24.14	4270.0	4300.0	-1.85	0.52	0.42
4370.0	4400.0	17.51	9.20	7.89	4370.0	4400.0	5.11	24.58	25.45	4370.0	4400.0	-5.02	0.20	0.34

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Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2512MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=813.9MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=4210.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+13			+13			+13
1412.0	1100.0	10.78	10.1	824.0	8.01	1350.1	2860.0	10.78
1337.2	1174.8	9.30	50.1	864.0	7.03	1310.1	2900.0	10.15
1262.5	1249.5	7.30	90.1	904.0	6.89	1270.1	2940.0	9.66
1187.7	1324.3	6.82	130.1	944.0	6.83	1230.1	2980.0	9.66
1112.9	1399.1	7.55	170.1	984.0	6.72	1190.1	3020.0	9.92
1038.1	1473.9	7.78	210.1	1024.0	6.75	1150.1	3060.0	9.62
963.4	1548.6	8.35	250.1	1064.0	6.41	1110.1	3100.0	9.34
888.6	1623.4	9.65	290.1	1104.0	6.10	1070.1	3140.0	9.24
813.8	1698.2	9.51	330.1	1144.0	6.21	1030.1	3180.0	9.08
739.0	1773.0	8.06	370.1	1184.0	6.30	990.1	3220.0	9.04
664.3	1847.7	7.03	410.1	1224.0	6.14	950.1	3260.0	9.07
589.5	1922.5	6.61	450.1	1264.0	6.02	910.1	3300.0	9.14
514.7	1997.3	6.50	490.1	1304.0	6.07	870.1	3340.0	9.31
439.9	2072.1	6.01	530.1	1344.0	6.21	830.1	3380.0	9.31
365.2	2146.8	5.65	570.1	1384.0	6.44	790.1	3420.0	9.27
290.4	2221.6	5.33	610.1	1424.0	6.41	750.1	3460.0	9.32
215.6	2296.4	5.26	650.1	1464.0	6.49	710.1	3500.0	9.48
140.9	2371.1	5.37	690.1	1504.0	6.76	670.1	3540.0	9.83
66.1	2445.9	6.05	730.1	1544.0	6.91	630.1	3580.0	9.92
10.0	2522.0	6.91	770.1	1584.0	7.12	610.1	3600.0	10.04
95.2	2607.2	6.66	810.1	1624.0	7.26	570.1	3640.0	9.79
180.5	2692.5	6.77	850.1	1664.0	7.26	550.1	3660.0	9.75
265.7	2777.7	7.11	890.1	1704.0	7.46	510.1	3700.0	9.62
350.9	2862.9	6.91	930.1	1744.0	7.67	490.1	3720.0	9.53
436.1	2948.1	6.13	970.1	1784.0	7.63	450.1	3760.0	9.48
521.4	3033.4	6.27	1010.1	1824.0	7.42	430.1	3780.0	9.19
606.6	3118.6	6.36	1050.1	1864.0	7.59	390.1	3820.0	8.98
691.8	3203.8	6.42	1090.1	1904.0	7.71	370.1	3840.0	8.89
777.0	3289.0	6.51	1130.1	1944.0	7.47	330.1	3880.0	8.60
862.3	3374.3	6.57	1190.1	2004.0	7.69	310.1	3900.0	8.56
947.5	3459.5	6.36	1230.1	2044.0	7.75	270.1	3940.0	8.27
1011.4	3523.4	6.41	1290.1	2104.0	8.03	250.1	3960.0	8.20
1096.6	3608.6	6.41	1330.1	2144.0	8.33	210.1	4000.0	8.07
1160.6	3672.6	6.45	1390.1	2204.0	8.17	190.1	4020.0	7.90
1245.8	3757.8	6.60	1430.1	2244.0	8.22	150.1	4060.0	7.85
1309.7	3821.7	6.96	1490.1	2304.0	8.49	130.1	4080.0	7.88
1394.9	3906.9	7.71	1530.1	2344.0	8.68	90.1	4120.0	7.86
1458.9	3970.9	8.42	1590.1	2404.0	9.17	70.1	4140.0	7.89
1544.1	4056.1	9.73	1630.1	2444.0	9.52	30.1	4180.0	8.00
1608.0	4120.0	10.87	1690.1	2504.0	10.30	10.1	4200.0	8.63

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Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+10	+13	+16	+10	+13	+16
700.0	50.47	52.36	48.02	25.07	25.08	25.20
800.0	47.94	40.16	39.15	22.44	23.17	25.76
900.0	35.99	36.03	36.76	21.70	24.48	27.38
1000.0	39.29	39.83	40.69	23.62	26.71	29.38
1100.0	46.39	46.96	46.49	26.01	29.13	31.45
1200.0	46.34	44.34	42.56	28.71	31.62	31.89
1300.0	44.14	39.58	37.49	31.83	33.73	31.98
1400.0	40.83	37.17	34.55	34.99	36.57	34.71
1500.0	38.07	34.94	32.69	34.55	40.27	44.07
1600.0	37.11	34.53	32.91	28.18	30.01	31.76
1700.0	37.14	34.82	33.54	25.76	26.93	27.16
1800.0	37.07	36.41	34.70	20.21	21.35	21.51
1900.0	36.55	35.03	33.88	14.79	16.07	16.90
2000.0	35.52	34.60	33.67	10.97	12.47	13.55
2100.0	35.70	34.45	33.39	9.50	11.20	12.60
2200.0	35.55	34.13	33.19	9.78	11.59	13.33
2300.0	34.47	32.83	31.74	10.84	12.77	14.72
2400.0	33.53	31.61	29.86	12.13	14.18	16.22
2500.0	35.27	33.21	31.64	13.45	15.58	17.68
2600.0	33.27	30.41	29.08	14.97	17.06	18.87
2680.0	32.69	30.66	28.73	16.33	18.18	19.66
2780.0	31.95	29.88	27.96	18.00	18.90	19.07
2860.0	32.36	30.79	27.94	19.37	19.51	18.93
2960.0	31.53	29.54	26.79	21.17	20.88	19.84
3040.0	30.15	27.89	26.08	24.17	22.56	21.23
3140.0	29.03	26.99	25.09	27.49	24.52	22.58
3220.0	28.67	26.87	25.09	28.77	26.48	24.71
3320.0	28.31	27.06	25.52	25.94	25.28	24.47
3400.0	27.60	26.87	25.76	25.71	26.25	26.44
3500.0	26.03	25.79	24.98	24.22	24.85	25.15
3580.0	25.09	24.98	24.38	21.74	22.60	22.92
3680.0	24.63	24.44	24.20	18.82	19.58	20.50
3760.0	24.80	24.42	24.04	17.53	18.26	19.31
3860.0	25.46	25.12	24.82	18.56	19.12	20.42
3940.0	25.72	25.40	24.92	20.10	20.72	22.16
4040.0	25.76	25.54	25.07	16.42	17.51	19.20
4120.0	25.91	25.60	25.24	15.07	16.12	17.81
4220.0	26.53	26.12	25.41	14.75	15.90	17.60
4300.0	27.16	27.18	26.31	14.47	15.47	16.94
4400.0	28.08	28.10	26.83	14.35	15.54	16.54

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+10	+13	+16
670.0	700.0	24.65	24.50	19.99
770.0	800.0	21.18	15.15	13.67
870.0	900.0	13.67	12.48	11.99
970.0	1000.0	14.52	13.71	13.20
1070.0	1100.0	17.25	16.41	15.92
1170.0	1200.0	20.03	19.60	19.46
1270.0	1300.0	22.48	22.44	22.26
1370.0	1400.0	23.63	23.98	24.75
1470.0	1500.0	24.02	24.29	24.86
1570.0	1600.0	24.81	25.89	26.59
1670.0	1700.0	24.47	24.97	25.36
1770.0	1800.0	25.86	26.45	26.47
1870.0	1900.0	28.52	28.36	28.21
1970.0	2000.0	33.93	33.75	33.54
2070.0	2100.0	40.39	39.22	38.62
2170.0	2200.0	36.68	36.35	36.55
2270.0	2300.0	37.39	37.86	38.94
2370.0	2400.0	38.72	38.62	38.66
2470.0	2500.0	41.00	41.58	41.98
2570.0	2600.0	34.85	34.93	35.10
2650.0	2680.0	32.30	31.63	31.09
2750.0	2780.0	29.36	28.92	28.78
2830.0	2860.0	27.41	26.83	26.71
2930.0	2960.0	26.54	25.72	25.99
3010.0	3040.0	25.53	25.32	25.47
3110.0	3140.0	24.85	24.47	24.46
3190.0	3220.0	24.57	24.19	24.01
3290.0	3320.0	38.03	40.25	37.43
3370.0	3400.0	20.90	20.24	19.95
3470.0	3500.0	20.58	20.11	19.94
3550.0	3580.0	20.64	19.88	19.88
3650.0	3680.0	22.96	21.90	21.68
3730.0	3760.0	24.01	22.10	21.38
3830.0	3860.0	25.45	24.04	23.38
3910.0	3940.0	30.59	29.50	29.76
4010.0	4040.0	39.31	43.38	40.72
4090.0	4120.0	32.58	32.37	31.37
4190.0	4220.0	28.03	25.97	25.12
4270.0	4300.0	27.62	25.91	24.84
4370.0	4400.0	28.43	28.88	28.32

Frequency Mixer

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Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=4200MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+10	+13	+16		+10	+13	+16		+10	+13	+16
670.0	700.0	8.55	4.53	3.21	700.0	25.94	25.56	19.32	10.0	1.73	1.04	1.38
770.0	800.0	2.90	2.34	2.04	800.0	19.32	10.69	7.53	50.0	1.69	1.12	1.39
870.0	900.0	2.39	1.95	1.73	900.0	5.13	4.34	4.87	90.0	1.79	1.20	1.41
970.0	1000.0	2.86	2.57	2.37	1000.0	2.22	2.71	3.53	130.0	1.89	1.27	1.44
1070.0	1100.0	3.24	3.03	2.88	1100.0	1.25	1.81	2.54	170.0	2.06	1.39	1.50
1170.0	1200.0	3.43	3.29	3.24	1200.0	1.26	1.34	1.90	210.0	2.27	1.46	1.51
1270.0	1300.0	3.59	3.36	3.29	1300.0	1.69	1.13	1.50	250.0	2.52	1.59	1.57
1370.0	1400.0	3.68	3.35	3.13	1400.0	1.89	1.10	1.38	290.0	2.84	1.74	1.62
1470.0	1500.0	3.64	3.19	2.89	1500.0	1.90	1.29	1.58	330.0	3.14	1.92	1.71
1570.0	1600.0	3.48	3.06	2.79	1600.0	1.83	1.55	1.92	370.0	3.46	2.11	1.81
1670.0	1700.0	3.37	2.94	2.65	1700.0	1.81	1.80	2.29	410.0	3.81	2.31	1.92
1770.0	1800.0	3.37	2.76	2.52	1800.0	1.62	1.83	2.36	450.0	4.07	2.49	2.04
1870.0	1900.0	3.07	2.77	2.61	1900.0	1.26	1.67	2.34	490.0	4.42	2.68	2.15
1970.0	2000.0	3.38	3.10	2.91	2000.0	1.12	1.65	2.32	530.0	4.77	2.87	2.27
2070.0	2100.0	3.41	3.09	2.89	2100.0	1.37	1.70	2.30	570.0	5.14	3.06	2.37
2170.0	2200.0	3.40	3.07	2.86	2200.0	1.73	1.83	2.32	610.0	5.61	3.31	2.53
2270.0	2300.0	3.30	2.85	2.60	2300.0	2.16	2.01	2.34	650.0	5.93	3.39	2.55
2370.0	2400.0	2.72	2.27	2.01	2400.0	2.55	2.18	2.36	710.0	6.46	3.67	2.76
2470.0	2500.0	2.69	2.33	2.11	2500.0	2.77	2.17	2.27	750.0	6.73	3.73	2.78
2570.0	2600.0	3.05	2.52	2.22	2600.0	3.03	2.22	2.11	810.0	7.22	3.98	3.00
2650.0	2680.0	2.86	2.48	2.11	2680.0	2.91	2.08	2.04	850.0	7.25	3.94	2.99
2750.0	2780.0	2.46	2.20	1.97	2780.0	2.69	1.72	1.63	910.0	7.28	4.07	3.13
2830.0	2860.0	2.20	1.87	1.64	2860.0	2.46	1.47	1.31	950.0	7.44	4.17	3.23
2930.0	2960.0	1.86	1.66	1.63	2960.0	2.63	1.54	1.31	1010.0	7.41	4.24	3.31
3010.0	3040.0	1.80	1.73	1.73	3040.0	2.66	1.56	1.33	1050.0	7.41	4.29	3.42
3110.0	3140.0	1.81	1.75	1.76	3140.0	2.55	1.53	1.34	1110.0	7.08	4.25	3.45
3190.0	3220.0	1.82	1.73	1.72	3220.0	2.36	1.47	1.36	1150.0	7.22	4.47	3.76
3290.0	3320.0	1.85	1.69	1.63	3320.0	2.20	1.44	1.44	1210.0	6.81	4.33	3.76
3370.0	3400.0	1.97	1.77	1.69	3400.0	2.09	1.42	1.51	1250.0	6.78	4.53	4.10
3470.0	3500.0	2.33	2.06	1.91	3500.0	2.08	1.55	1.66	1310.0	6.15	4.33	4.15
3550.0	3580.0	2.65	2.35	2.14	3580.0	2.09	1.65	1.82	1350.0	6.26	4.74	4.68
3650.0	3680.0	3.09	2.75	2.55	3680.0	2.23	1.81	1.97	1410.0	5.61	4.74	4.98
3730.0	3760.0	3.22	2.81	2.61	3760.0	2.42	1.97	2.13	1450.0	5.51	4.93	5.30
3830.0	3860.0	3.23	2.82	2.63	3860.0	2.84	2.23	2.28	1510.0	5.06	5.33	6.01
3910.0	3940.0	3.97	3.45	3.22	3940.0	3.38	2.56	2.48	1550.0	4.96	5.70	6.53
4010.0	4040.0	4.45	3.80	3.53	4040.0	4.32	3.03	2.71	1610.0	4.83	6.44	7.50
4090.0	4120.0	4.96	4.06	3.67	4120.0	5.23	3.50	2.92	1650.0	4.89	6.83	7.94
4190.0	4220.0	5.41	4.23	3.70	4220.0	6.46	4.02	3.15	1710.0	5.31	7.53	8.64
4270.0	4300.0	6.73	4.40	3.73	4300.0	7.66	4.52	3.10	1750.0	5.63	7.70	8.68
4370.0	4400.0	8.86	5.46	4.52	4400.0	8.72	5.93	3.53	1810.0	5.83	7.31	8.08

REV. X2

SIM-ED12399/13

101031

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant
P.O. Box 350186, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+9	11	10	21	34	57	35	40	40	---
1	-	31	+0	38	19	31	35	71	45	68	49	60
2	73	52	52	55	49	62	51	64	72	71	67	73
3	>90	63	58	>78	59	>78	66	73	69	>78	76	>78
4	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
5	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
6	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
7	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
8	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
9	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
10	---	---	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

Test conditions:

RF IN: 2512 MHz; -6.00 dBm.
LO IN: 2542 MHz; +13.00 dBm
IF OUT: 30 MHz; -12.31 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	1	22	22	34	46	59	47	53	54	---
1	-	31	+0	40	19	35	37	70	51	69	56	65
2	53	43	44	46	40	56	45	52	65	69	63	67
3	86	40	34	59	35	58	45	46	49	78	59	76
4	>90	63	56	55	56	53	57	64	57	68	73	71
5	>90	66	56	60	54	72	52	73	63	68	64	85
6	>90	>88	87	74	77	66	71	60	73	71	72	80
7	>90	>88	>88	87	75	74	66	80	60	83	73	75
8	>90	>88	>88	>88	>88	82	83	76	83	70	78	86
9	>90	>88	>88	>88	>88	>88	87	82	80	>88	74	>88
10	---	---	>88	>88	>88	>88	>88	>88	>88	87	>88	76
RF CAL	0	1	2	3	4	5	6	7	8	9	10	

LO HARMONICS ORDER

Test conditions:

RF IN: 2512 MHz; 4.00 dBm.
LO IN: 2542 MHz; +13.00 dBm
IF OUT: 30 MHz; -2.22 dBm

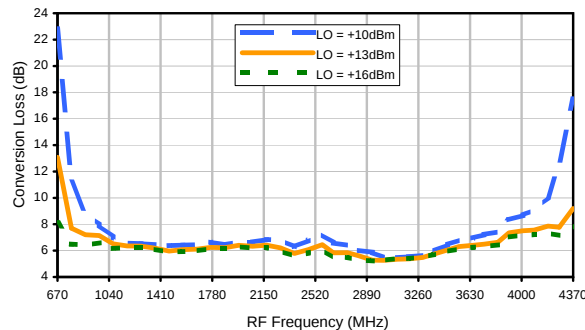
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Frequency Mixer

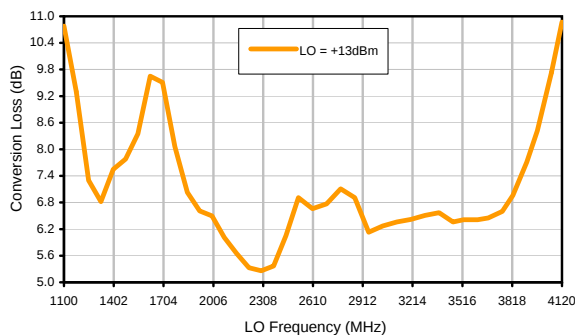
SIM-ED12399/13

Typical Performance Curves

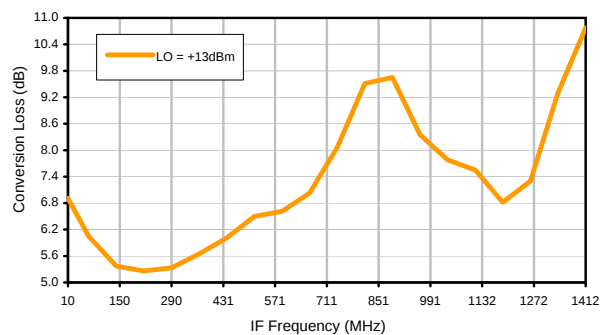
Conversion Loss @ IF=30MHz



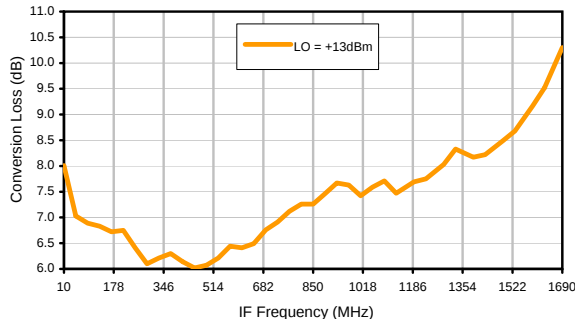
Conversion Loss vs. LO @ RF=2512MHz



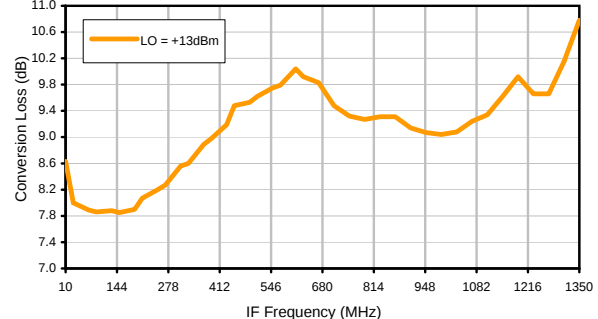
Conversion Loss vs. IF @ RF=2512MHz



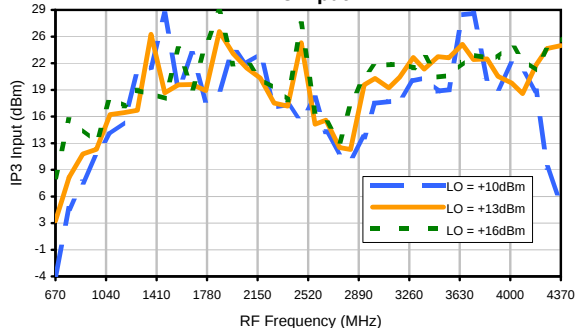
Conversion Loss vs. IF @ RF=813.9MHz



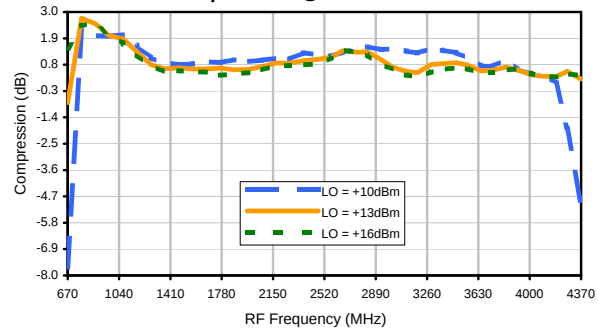
Conversion Loss vs. IF @ RF=4210.1MHz



IP3 Input



Compression @ RF IN=+9dBm

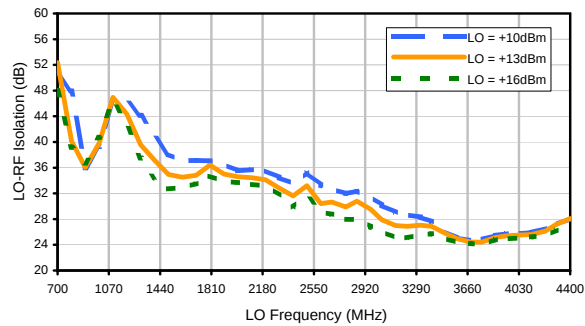


Frequency Mixer

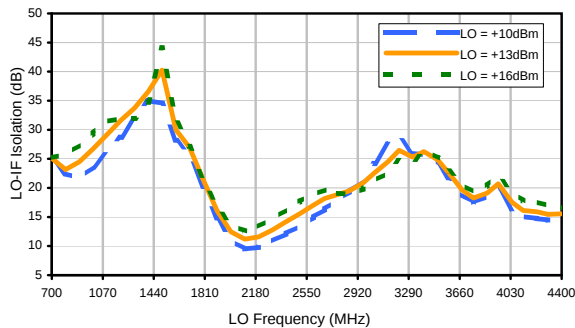
SIM-ED12399/13

Typical Performance Curves

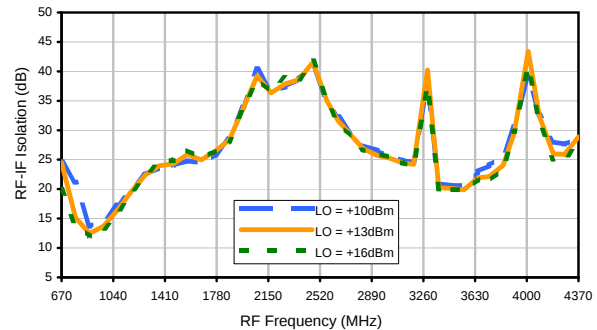
LO-RF Isolation



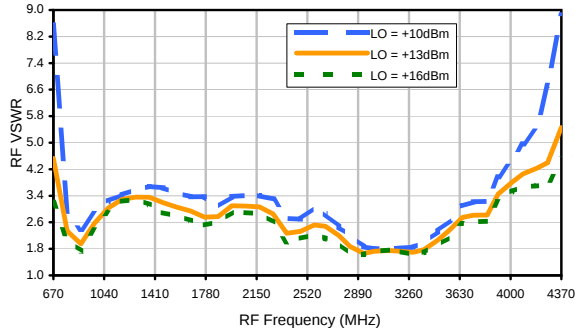
LO-IF Isolation



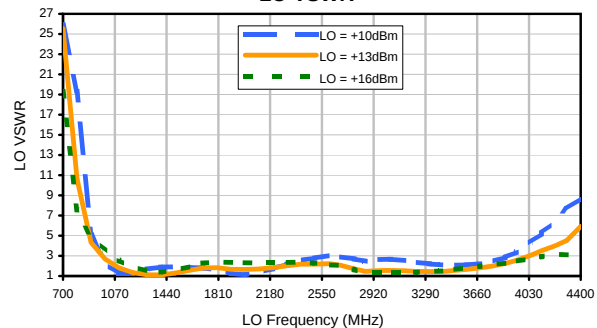
RF-IF Isolation



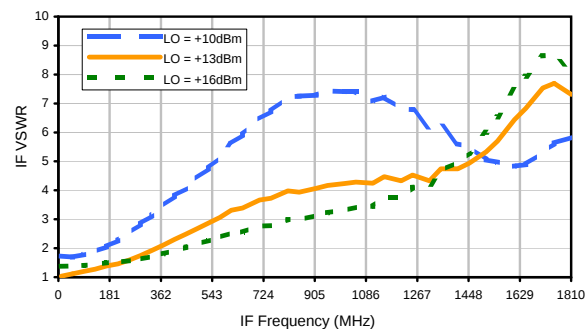
RF VSWR



LO VSWR



IF VSWR



Frequency Mixer

SIM-ED12399/13

Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	+9	11	10	21	34	57	35	40	40	---
1	-	31	+0	38	19	31	35	71	45	68	49	60
2	73	52	52	55	49	62	51	64	72	71	67	73
3	>90	63	58	>78	59	>78	66	73	69	>78	76	>78
4	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
5	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
6	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
7	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
8	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
9	>90	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
10	---	---	>78	>78	>78	>78	>78	>78	>78	>78	>78	>78
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

Test conditions: RF IN: 2512 MHz; -6.00 dBm.
LO IN: 2542 MHz; +13.00 dBm
IF OUT: 30 MHz; -12.31 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	1	22	22	34	46	59	47	53	54	---
1	-	31	+0	40	19	35	37	70	51	69	56	65
2	53	43	44	46	40	56	45	52	65	69	63	67
3	86	40	34	59	35	58	45	46	49	78	59	76
4	>90	63	56	55	56	53	57	64	57	68	73	71
5	>90	66	56	60	54	72	52	73	63	68	64	85
6	>90	>88	87	74	77	66	71	60	73	71	72	80
7	>90	>88	>88	87	75	74	66	80	60	83	73	75
8	>90	>88	>88	>88	>88	82	83	76	83	70	78	86
9	>90	>88	>88	>88	>88	>88	87	82	80	>88	74	>88
10	---	---	>88	>88	>88	>88	>88	>88	>88	87	>88	76
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

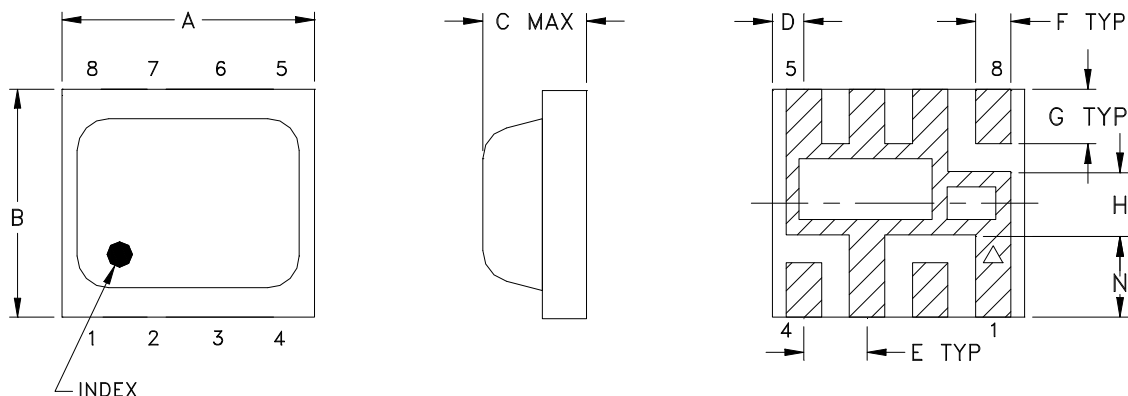
LO HARMONICS ORDER

Test conditions: RF IN: 2512 MHz; 4.00 dBm.
LO IN: 2542 MHz; +13.00 dBm
IF OUT: 30 MHz; -2.22 dBm

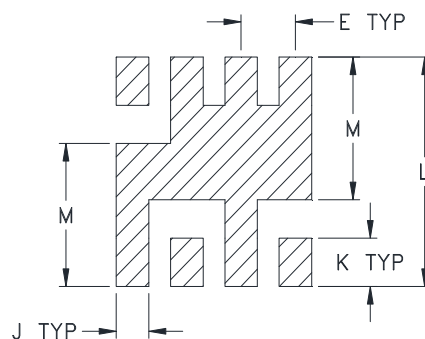
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Outline Dimensions

HV1195



PCB Metal Land Pattern



Suggested Layout,
Tolerance to be within $\pm.002$

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
HV1195	0.200 (5.08)	0.180 (4.57)	0.087 (2.21)	0.025 (0.64)	0.050 (1.27)	0.028 (0.71)	0.043 (1.09)	0.050 (1.27)	0.030 (0.76)	0.043 (1.09)	0.204 (5.18)	0.127 (3.23)	0.065 (1.65)

CASE#	WT, GRAM
HV1195	.08

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

Notes:

1. Case material: Plastic encapsulation on Ceramic base.
2. Termination finish: Palladium Silver.



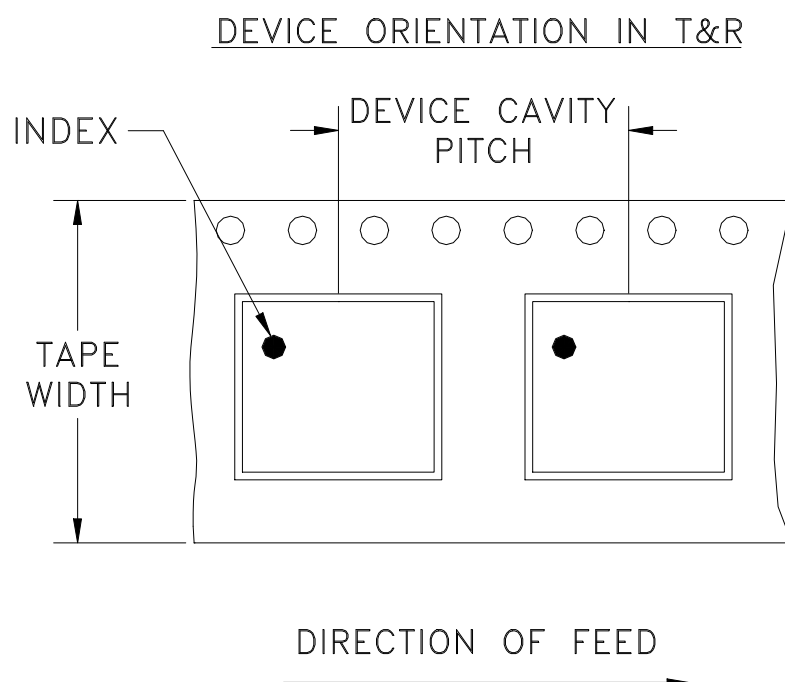
P.O. Box 350186, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F82



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
12	8	7	500

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



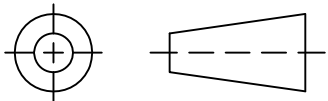
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THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M104559	NEW RELEASE	04/11/06	MMG	DJ
A	M109513	MODIFIED SMOBC AREA, REMOVED NOTE 3	01/31/07	PW	DJ
B	M176274	MODIFIED CASE STYLE	09/23/19	ITG	RB

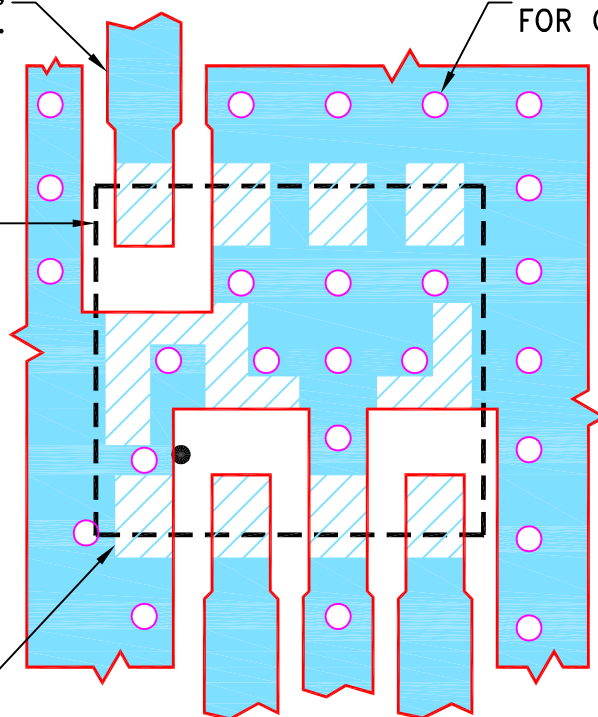
SUGGESTED MOUNTING CONFIGURATION FOR HV1195 CASE STYLE, "rh" PIN CONNECTION

COPLANAR WAVEGUIDE
.038 LINE WIDTH,
.013 GAP, 2 PL.

Ø.013 PTH
FOR GROUND

PACKAGE
OUTLINE

PIN 1

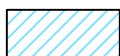


NOTES:

- TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020"±.0015"; COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
- 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

TOLERANCES ON:

2 PL DECIMALS ±

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±

DRAWN

MMG

04/10/06

CHECKED

IL

04/11/06

APPROVED

DJ

04/11/06



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, rh, HV1195, SIM, TB-382

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-239

REV:

B

FILE:

98PL239

SCALE:

10:1

SHEET:

1 OF 1

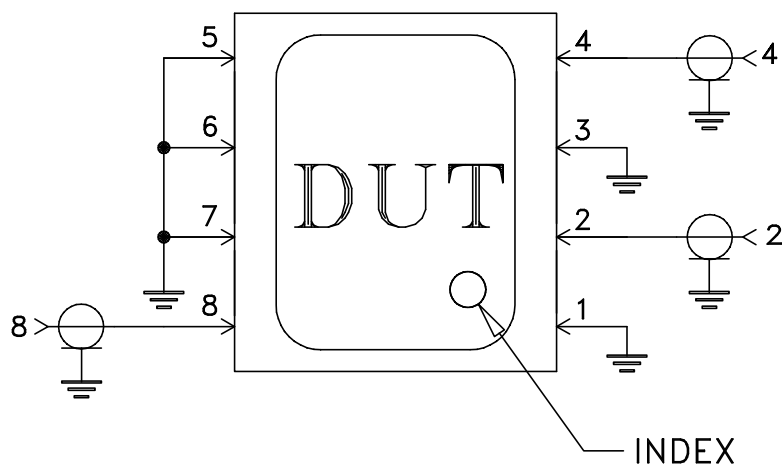
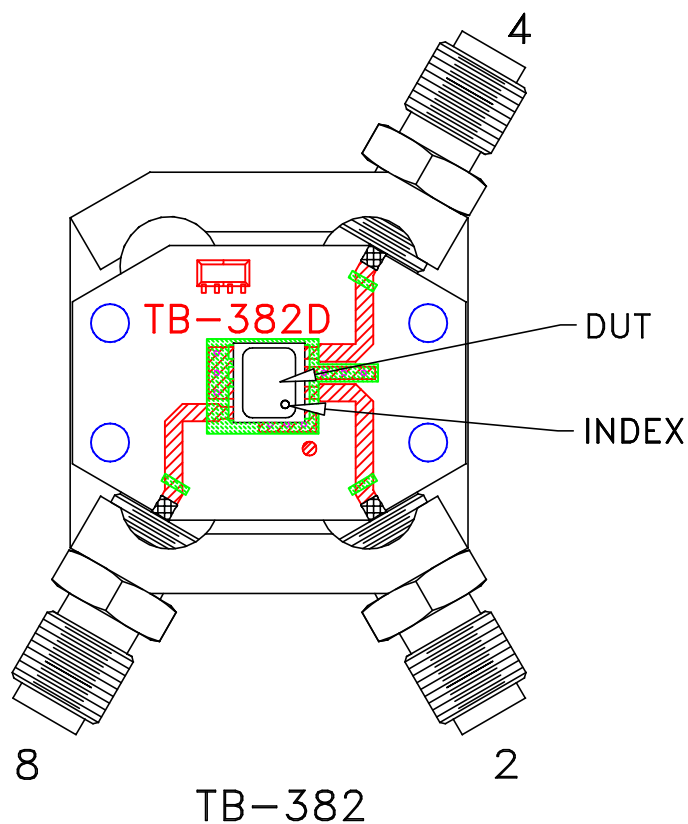
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ASHEETA1.DWG REV:A DATE:01/12/95

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=.020 inch.

 **Mini-Circuits®**



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

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85° C Case Temperature	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102-C, Condition C
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process: 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 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