

High IP3 Frequency Mixer

Level 21 (LO Power +21 dBm) 470 to 1730 MHz

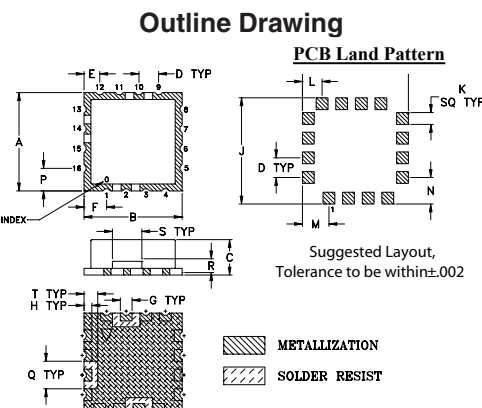
Maximum Ratings

Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
LO Power	+24 dBm
RF Power	+21 dBm

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

Pin Connections

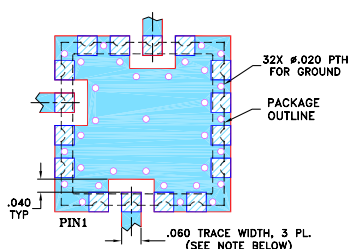
LO	10
RF	2
IF	14
GROUND	1,3,4,5,6,7,8,9,11,12,13,15,16



Outline Dimensions (inch)

A	B	C	D	E	F	G	H	J	K
.500	.500	.180	.100	.080	.115	.060	.040	.540	.060
12.7	12.7	4.572	2.54	2.032	2.921	1.524	1.016	13.72	1.524
L	M	N	P	Q	R	S	T	wt.	
.100	.135	.135	.115	.140	.070	.150	.070	grams	
2.54	3.429	3.429	2.921	3.556	1.778	3.81	1.778	1.0	

Demo Board MCL P/N: TB-433+ Suggested PCB Layout (PL-012)



NOTES: 1. TRACE WIDTH IS SHOWN FOR FR4 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.
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- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Features

- very high IP3, 32 dBm typ.
- wideband, 470 to 1730 MHz
- excellent L-R isolation, 52 dB typ. and L-I isolation, 50 dB typ.
- high 1 dB compression, 20 dBm typ.
- shielded metal cover
- aqueous washable
- protected by US Patent 6,807,407

Applications

- satellite communication
- UHF receivers, transmitters
- GPS
- cellular
- defense communication

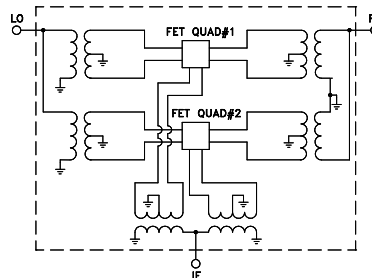
Electrical Specifications (T_{AMB} = 25°C)

FREQUENCY (MHz)			CONVERSION LOSS (dB)			RF in at 1dB Compr (dBm)	IP3 (dBm)	LO-RF ISOLATION (dB)		LO-IF ISOLATION (dB)	
RF	LO	IF	Typ.	σ	Max.	Typ.	Typ.	Typ.	Min.	Typ.	Min.
470-1730	600-1800	70-1000	6.8	0.2	8.9	+20	32	52	38	50	36

Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)	IP3 (dBm)	IF Freq. (MHz)	VSWR IF (:1)
RF	LO	LO +21dBm	LO +21dBm	LO +21dBm	LO +21dBm	LO +21dBm	LO +21dBm		LO +21dBm
430.10	564.90	6.11	50.26	60.35	1.57	4.42	30.29	70.00	1.95
470.10	600.10	6.54	52.88	58.91	1.57	4.24	29.54	100.00	1.80
570.90	696.10	6.52	55.33	52.96	1.68	4.10	29.38	120.00	1.81
671.70	792.10	6.47	53.24	49.22	1.81	3.87	30.88	140.00	1.78
772.50	888.10	6.41	49.96	48.12	1.91	3.58	32.01	160.00	1.73
873.30	984.10	6.32	46.96	47.11	1.98	3.21	33.60	180.00	1.71
1074.90	1176.10	6.38	43.21	44.31	1.92	2.44	33.09	200.00	1.70
1175.70	1272.10	6.47	43.47	42.45	1.84	2.22	31.68	300.00	1.57
1276.50	1368.10	6.61	45.03	42.04	1.75	2.20	31.26	400.00	1.42
1377.30	1464.10	6.84	46.98	42.95	1.67	2.46	31.39	500.00	1.29
1478.10	1560.10	7.10	48.08	45.58	1.60	2.91	30.48	600.00	1.17
1578.90	1656.10	7.38	51.04	50.04	1.53	3.38	31.09	700.00	1.13
1679.70	1752.10	7.59	57.31	57.60	1.49	3.73	31.52	750.00	1.13
1730.10	1800.10	7.65	60.39	53.90	1.45	4.07	30.32	800.00	1.13
1770.10	1835.30	7.57	55.84	48.95	1.45	3.75	31.57	1000.00	1.12

Electrical Schematic

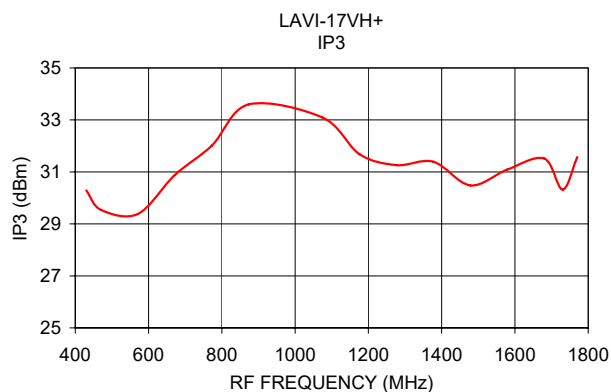
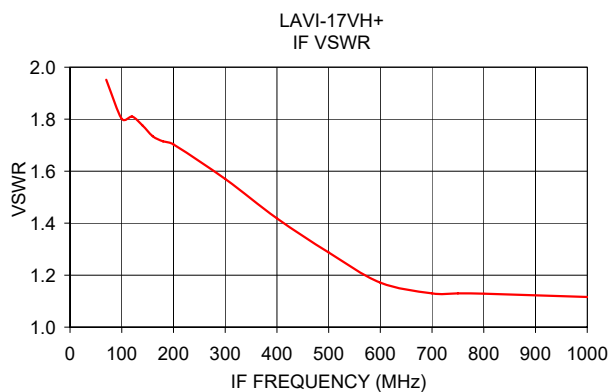
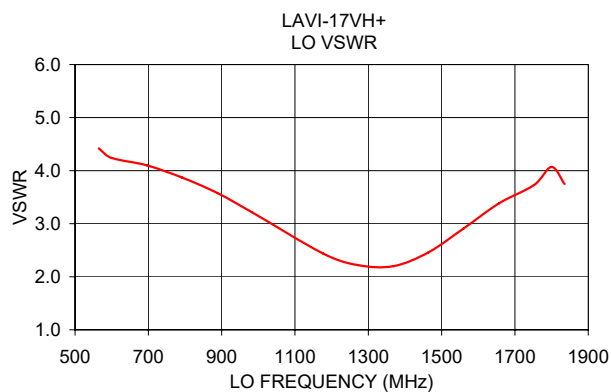
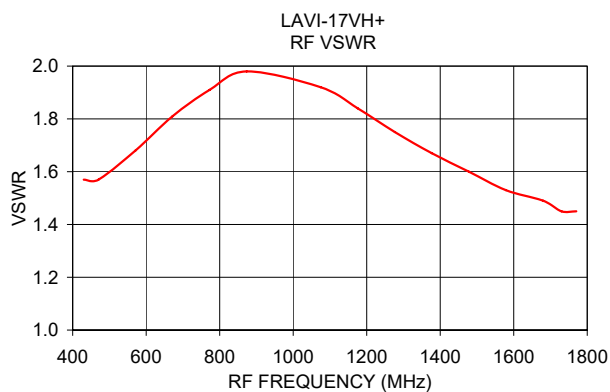
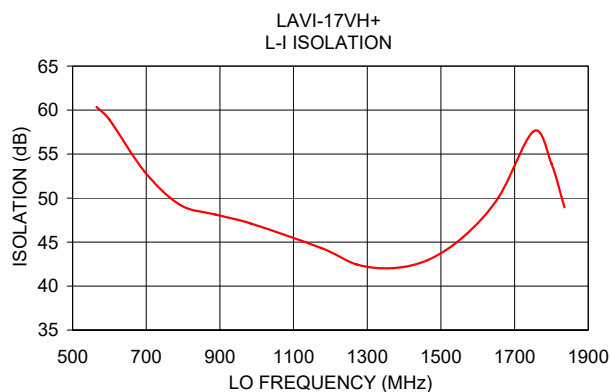
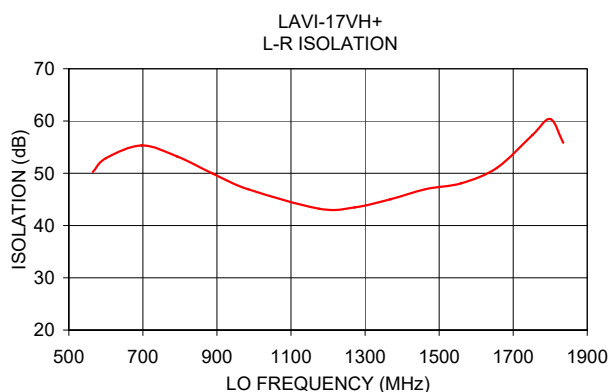
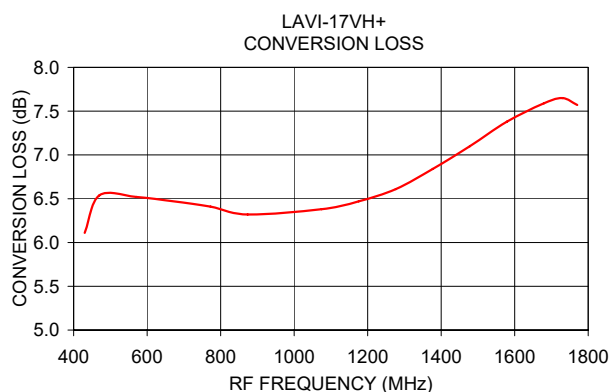


Generic photo used for illustration purposes only

CASE STYLE: CK605

+RoHS Compliant

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



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		RF CAL (-dBc)											
RF HARMONICS ORDER	0	-	-	22	27	26	25	36	40	45	52	52	46
	1	-	28	0	39	18	41	36	58	50	55	43	66
	2	90	69	66	55	66	59	71	59	81	72	83	70
	3	93	103	79	86	75	87	82	97	86	100	95	101
	4	96	102	100	97	94	94	94	100	100	102	100	101
	5	94	102	101	99	97	95	95	97	100	101	103	104
	6	96	104	102	100	96	96	94	93	97	97	101	102
	7	91	100	102	104	98	97	96	92	96	98	99	102
	8	94	102	100	101	101	100	100	93	94	93	96	99
	9	93	92	102	95	99	85	102	79	90	75	90	79
10	94	92	73	83	70	80	59	71	59	67	54	67	
		0	1	2	3	4	5	6	7	8	9	10	
		LO HARMONICS ORDER											

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Frequency Mixer

LAVI-17VH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS IF FIXED @IF(OUT)=130MHz (dB)		
		@LO (dBm)		
		+19	+21	+23
10.1	140.1	5.89	5.78	5.66
89.8	219.8	6.30	6.20	6.12
169.6	299.6	6.40	6.30	6.24
249.3	379.3	6.49	6.41	6.35
329.1	459.1	6.54	6.45	6.37
408.8	538.8	6.59	6.50	6.44
488.6	618.6	6.63	6.54	6.47
568.3	698.3	6.68	6.59	6.51
648.0	778.0	6.70	6.60	6.53
727.8	857.8	6.81	6.70	6.63
807.5	937.5	6.88	6.77	6.70
887.3	1017.3	7.08	6.98	6.91
967.0	1097.0	7.35	7.26	7.18
1046.7	1176.7	7.54	7.44	7.37
1126.5	1256.5	7.68	7.59	7.52
1206.2	1336.2	7.84	7.74	7.68
1286.0	1416.0	8.05	7.95	7.90
1365.7	1495.7	8.16	8.08	8.02
1445.5	1575.5	8.26	8.18	8.13
1525.2	1655.2	8.29	8.22	8.17
1604.9	1734.9	8.31	8.23	8.19
1684.7	1814.7	8.39	8.31	8.25
1764.4	1894.4	8.49	8.40	8.33
1844.2	1974.2	8.58	8.46	8.40
1923.9	2053.9	8.63	8.52	8.43
2003.6	2133.6	8.66	8.53	8.43
2083.4	2213.4	8.66	8.51	8.39
2163.1	2293.1	8.72	8.55	8.44
2242.9	2372.9	8.78	8.61	8.48
2322.6	2452.6	8.88	8.69	8.54
2402.4	2532.4	8.86	8.66	8.47
2482.1	2612.1	8.85	8.61	8.40
2561.8	2691.8	8.90	8.60	8.40
2641.6	2771.6	9.05	8.74	8.53
2721.3	2851.3	9.21	8.86	8.63
2801.1	2931.1	9.37	9.06	8.83
2880.8	3010.8	9.61	9.27	9.02
2960.6	3090.6	9.85	9.50	9.38
3040.3	3170.3	10.19	9.82	9.54
3100.1	3230.1	10.61	10.23	10.12

RF (IN) (MHz)	LO (MHz)	IP3 INPUT (dBm)		
		@LO (dBm)		
		+19	+21	+23
10.1	140.1	23.20	25.37	27.45
89.8	219.8	26.42	28.70	30.41
169.6	299.6	28.22	29.83	30.98
249.3	379.3	29.35	31.18	32.71
329.1	459.1	29.96	31.91	33.84
408.8	538.8	29.83	32.06	34.24
488.6	618.6	30.23	32.40	34.55
568.3	698.3	29.65	31.50	33.68
648.0	778.0	29.91	32.19	34.52
727.8	857.8	29.56	31.83	33.84
807.5	937.5	30.30	32.90	34.85
887.3	1017.3	29.23	31.09	32.55
967.0	1097.0	29.09	30.87	32.70
1046.7	1176.7	28.53	30.40	32.14
1126.5	1256.5	28.60	30.63	32.62
1206.2	1336.2	28.39	30.29	32.10
1286.0	1416.0	28.68	30.92	33.36
1365.7	1495.7	28.55	30.48	32.60
1445.5	1575.5	29.08	31.37	34.18
1525.2	1655.2	29.11	31.15	33.54
1604.9	1734.9	29.67	31.77	34.81
1684.7	1814.7	29.81	31.95	34.88
1764.4	1894.4	30.10	32.31	35.40
1844.2	1974.2	29.66	32.12	34.97
1923.9	2053.9	29.47	31.72	34.73
2003.6	2133.6	28.08	30.22	32.73
2083.4	2213.4	27.29	29.25	31.89
2163.1	2293.1	26.05	28.01	29.84
2242.9	2372.9	25.44	27.27	29.21
2322.6	2452.6	24.62	26.32	28.12
2402.4	2532.4	23.81	25.44	27.34
2482.1	2612.1	22.97	24.78	26.75
2561.8	2691.8	22.05	24.07	25.80
2641.6	2771.6	21.32	23.52	25.30
2721.3	2851.3	20.50	22.77	24.65
2801.1	2931.1	20.24	22.38	24.35
2880.8	3010.8	19.80	22.01	24.22
2960.6	3090.6	19.48	21.87	24.07
3040.3	3170.3	19.04	21.39	23.89
3100.1	3230.1	18.88	21.28	23.75

Frequency Mixer

LAVI-17VH+

Typical Performance Data

IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1100MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=460MHz (dB)	IF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1730.1MHz (dB)
		@LO (dBm)			@LO (dBm)			@LO (dBm)
		+21			+21			+21
1079.9	20.1	9.19	10.1	470.1	13.85	1490.0	240.1	10.24
1029.7	70.3	7.97	50.3	510.3	7.08	1450.0	280.1	10.10
979.6	120.4	7.56	90.6	550.6	6.64	1410.0	320.1	9.86
929.4	170.6	7.51	130.8	590.8	6.54	1370.0	360.1	9.72
879.3	220.7	7.34	171.0	631.0	6.53	1330.0	400.1	9.55
829.1	270.9	7.28	211.3	671.3	6.51	1290.0	440.1	9.32
779.0	321.0	7.17	251.5	711.5	6.44	1250.0	480.1	9.24
728.8	371.2	6.95	291.7	751.7	6.48	1210.0	520.1	9.15
678.7	421.3	7.21	332.0	792.0	6.49	1170.0	560.1	9.11
628.5	471.5	7.23	372.2	832.2	6.55	1130.0	600.1	9.00
578.4	521.6	7.16	412.4	872.4	6.45	1090.0	640.1	8.87
528.2	571.8	7.06	452.7	912.7	6.41	1050.0	680.1	8.71
478.1	621.9	7.06	492.9	952.9	6.38	1010.0	720.1	8.55
427.9	672.1	7.16	533.1	993.1	6.41	970.0	760.1	8.43
377.8	722.2	7.24	573.4	1033.4	6.55	930.0	800.1	8.42
327.6	772.4	7.23	613.6	1073.6	6.63	890.0	840.1	8.35
260.8	839.2	7.22	653.8	1113.8	6.72	850.0	880.1	8.29
210.6	889.4	7.30	694.1	1154.1	6.73	810.0	920.1	8.18
143.7	956.3	7.46	734.3	1194.3	6.79	770.0	960.1	8.09
93.6	1006.4	7.58	774.5	1234.5	6.86	730.0	1000.1	8.06
26.7	1073.3	9.23	814.8	1274.8	7.01	690.0	1040.1	8.06
33.3	1133.3	8.66	855.0	1315.0	7.16	650.0	1080.1	8.05
126.4	1226.4	7.60	895.2	1355.2	7.25	610.0	1120.1	8.00
196.3	1296.3	7.54	935.4	1395.4	7.35	570.0	1160.1	7.90
289.4	1389.4	7.53	975.7	1435.7	7.32	530.0	1200.1	7.81
359.2	1459.2	7.62	1036.0	1496.0	7.53	490.0	1240.1	7.78
452.4	1552.4	7.58	1076.3	1536.3	7.65	450.0	1280.1	7.84
522.2	1622.2	7.54	1136.6	1596.6	7.87	410.0	1320.1	7.92
615.4	1715.4	7.73	1176.8	1636.8	7.85	370.0	1360.1	7.99
685.2	1785.2	7.74	1237.2	1697.2	7.88	330.0	1400.1	8.00
778.3	1878.3	7.74	1277.4	1737.4	7.91	290.0	1440.1	8.00
848.2	1948.2	7.94	1337.8	1797.8	8.12	250.0	1480.1	8.03
941.3	2041.3	8.06	1378.0	1838.0	8.16	210.0	1520.1	8.10
1011.2	2111.2	8.13	1438.4	1898.4	8.34	190.0	1540.1	8.20
1104.3	2204.3	8.47	1478.6	1938.6	8.44	150.0	1580.1	8.24
1174.1	2274.1	8.67	1538.9	1998.9	8.79	130.0	1600.1	8.27
1267.3	2367.3	8.98	1579.2	2039.2	8.98	90.0	1640.1	8.43
1337.1	2437.1	9.39	1639.5	2099.5	9.36	70.0	1660.1	8.49
1430.3	2530.3	9.86	1679.8	2139.8	9.54	30.0	1700.1	9.45
1500.1	2600.1	10.20	1740.1	2200.1	10.05	10.0	1720.1	14.14

REV. X3
LAVI-17VH+
101012
Page 2 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0006 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



Frequency Mixer

LAVI-17VH+

Typical Performance Data

LO (MHz)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)		
	+19	+21	+23	+19	+21	+23
140.1	50.56	50.67	50.82	50.22	50.37	50.43
219.8	47.55	47.50	47.68	44.71	44.58	44.67
299.6	48.07	47.99	48.14	43.87	43.67	43.72
379.3	51.11	51.52	51.77	44.79	44.77	44.80
459.1	52.01	52.43	52.45	46.06	45.98	45.74
538.8	49.68	49.88	50.27	49.10	48.76	48.62
618.6	48.43	48.85	49.12	55.51	55.18	54.77
698.3	47.64	47.86	47.92	62.85	62.90	62.44
778.0	46.52	46.80	46.85	54.60	55.18	55.63
857.8	45.30	45.47	45.48	51.27	51.44	51.86
937.5	44.33	44.31	44.34	49.53	49.66	49.89
1017.3	43.37	43.46	43.25	48.18	48.36	48.44
1097.0	42.84	42.97	42.90	47.81	48.03	47.97
1176.7	43.00	42.97	43.02	46.22	45.99	46.03
1256.5	42.37	42.31	42.51	44.30	44.17	44.13
1336.2	42.47	42.41	42.62	44.08	43.94	43.96
1416.0	42.93	42.86	43.05	44.39	44.21	44.10
1495.7	43.37	43.55	43.61	45.17	45.02	45.06
1575.5	43.86	44.01	43.98	46.25	46.29	46.19
1655.2	44.92	44.92	45.08	46.68	46.59	46.63
1734.9	47.24	47.50	47.69	45.26	45.21	45.29
1814.7	50.79	51.25	51.47	42.99	43.02	42.86
1894.4	52.23	52.87	53.31	40.72	40.72	40.50
1974.2	49.66	49.72	49.68	39.62	39.33	39.32
2053.9	44.70	44.58	44.48	39.85	39.81	39.88
2133.6	41.27	41.14	40.94	39.99	40.04	40.02
2213.4	39.61	39.46	39.13	39.77	39.83	39.78
2293.1	37.63	37.32	37.19	39.31	39.28	39.35
2372.9	36.35	36.01	35.89	39.12	39.09	39.24
2452.6	35.18	35.11	34.99	39.26	39.45	39.56
2532.4	34.47	34.36	34.07	39.84	40.02	40.03
2612.1	33.11	33.00	32.72	39.62	39.82	39.81
2691.8	34.16	33.99	33.63	42.39	42.56	42.60
2771.6	33.54	33.14	32.93	43.80	43.77	43.74
2851.3	33.15	32.84	32.74	46.12	45.98	46.20
2931.1	32.86	32.64	32.51	48.03	47.97	47.96
3010.8	32.53	32.48	32.23	51.57	51.69	51.19
3090.6	32.25	32.07	32.04	57.44	58.18	58.78
3170.3	31.87	31.89	31.72	55.40	55.66	55.67
3230.1	31.97	31.83	31.74	50.52	50.08	49.59

RF (IN) (MHz)	LO (MHz)	RF-IF ISOLATION (dB)		
		@LO (dBm)		
		+19	+21	+23
10.1	140.1	45.27	46.38	48.00
89.8	219.8	45.37	48.56	50.85
169.6	299.6	47.50	48.80	48.45
249.3	379.3	40.08	38.54	36.91
329.1	459.1	38.09	37.83	40.16
408.8	538.8	35.75	35.18	34.46
488.6	618.6	34.21	33.18	31.94
568.3	698.3	38.06	37.70	37.62
648.0	778.0	38.09	36.86	34.78
727.8	857.8	42.20	41.49	39.97
807.5	937.5	44.17	44.84	43.83
887.3	1017.3	46.60	49.72	46.32
967.0	1097.0	40.70	42.20	46.11
1046.7	1176.7	39.27	41.46	48.41
1126.5	1256.5	36.21	37.10	38.81
1206.2	1336.2	34.59	35.21	36.43
1286.0	1416.0	33.97	34.67	35.92
1365.7	1495.7	32.82	33.22	33.77
1445.5	1575.5	32.06	32.47	33.32
1525.2	1655.2	30.92	31.20	31.57
1604.9	1734.9	29.93	30.15	30.45
1684.7	1814.7	28.91	29.04	29.26
1764.4	1894.4	28.25	28.34	28.48
1844.2	1974.2	28.08	28.16	28.27
1923.9	2053.9	27.94	27.99	28.04
2003.6	2133.6	27.86	27.91	27.96
2083.4	2213.4	27.78	27.78	27.74
2163.1	2293.1	28.11	28.03	27.99
2242.9	2372.9	28.97	28.90	28.78
2322.6	2452.6	30.02	29.95	29.85
2402.4	2532.4	30.41	30.38	30.28
2482.1	2612.1	30.84	30.83	30.82
2561.8	2691.8	31.11	31.15	31.18
2641.6	2771.6	31.98	32.09	32.42
2721.3	2851.3	32.19	32.26	32.30
2801.1	2931.1	32.40	32.43	32.59
2880.8	3010.8	32.81	32.77	32.85
2960.6	3090.6	33.22	32.96	32.25
3040.3	3170.3	33.85	33.58	33.38
3100.1	3230.1	34.64	34.27	33.43

Frequency Mixer

LAVI-17VH+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF VSWR (:1)			LO (MHz)	LO VSWR (:1)			IF (OUT) (MHz)	IF VSWR @LO=1800.1MHz (:1)		
		@LO (dBm)				@LO (dBm)				@LO (dBm)		
		+19	+21	+23		+19	+21	+23		+19	+21	+23
10.1	140.1	1.11	1.10	1.10	140.1	3.56	3.56	3.56	10.1	8.90	8.81	8.68
89.8	219.8	1.27	1.29	1.30	220.1	3.62	3.62	3.62	50.1	2.52	2.58	2.64
169.6	299.6	1.42	1.44	1.46	300.1	3.73	3.73	3.72	90.1	2.12	2.20	2.28
249.3	379.3	1.48	1.50	1.52	380.1	3.78	3.77	3.77	130.1	2.03	2.11	2.20
329.1	459.1	1.50	1.51	1.53	460.1	3.79	3.78	3.77	170.1	1.91	1.99	2.07
408.8	538.8	1.53	1.53	1.54	540.1	3.75	3.75	3.74	210.1	1.85	1.92	2.01
488.6	618.6	1.60	1.60	1.60	620.1	3.70	3.69	3.68	250.1	1.80	1.87	1.95
568.3	698.3	1.75	1.75	1.75	700.1	3.65	3.65	3.64	290.1	1.70	1.77	1.84
648.0	778.0	1.92	1.91	1.90	780.1	3.58	3.57	3.56	330.1	1.61	1.68	1.74
727.8	857.8	2.11	2.09	2.08	860.1	3.48	3.48	3.48	370.1	1.52	1.57	1.64
807.5	937.5	2.29	2.27	2.25	940.1	3.37	3.37	3.37	410.1	1.45	1.51	1.57
887.3	1017.3	2.46	2.44	2.42	1020.1	3.22	3.22	3.22	450.1	1.36	1.41	1.46
967.0	1097.0	2.56	2.54	2.52	1100.1	3.06	3.06	3.05	490.1	1.27	1.32	1.37
1046.7	1176.7	2.58	2.56	2.54	1180.1	2.90	2.89	2.88	530.1	1.20	1.24	1.29
1126.5	1256.5	2.60	2.57	2.55	1260.1	2.77	2.77	2.75	570.1	1.12	1.16	1.20
1206.2	1336.2	2.57	2.55	2.53	1340.1	2.66	2.66	2.66	610.1	1.08	1.12	1.15
1286.0	1416.0	2.48	2.46	2.43	1420.1	2.59	2.60	2.60	650.1	1.09	1.10	1.12
1365.7	1495.7	2.34	2.32	2.30	1500.1	2.57	2.57	2.57	690.1	1.15	1.15	1.15
1445.5	1575.5	2.20	2.17	2.14	1580.1	2.57	2.58	2.58	730.1	1.24	1.23	1.23
1525.2	1655.2	2.07	2.04	2.01	1660.1	2.61	2.61	2.61	790.1	1.34	1.33	1.33
1604.9	1734.9	1.97	1.94	1.90	1740.1	2.65	2.65	2.64	830.1	1.43	1.43	1.42
1684.7	1814.7	1.89	1.85	1.81	1820.1	2.66	2.66	2.65	890.1	1.56	1.55	1.54
1764.4	1894.4	1.83	1.79	1.75	1900.1	2.65	2.65	2.63	930.1	1.64	1.64	1.63
1844.2	1974.2	1.79	1.75	1.71	1980.1	2.60	2.60	2.60	990.1	1.77	1.77	1.77
1923.9	2053.9	1.77	1.73	1.68	2060.1	2.55	2.56	2.56	1030.1	1.84	1.84	1.84
2003.6	2133.6	1.75	1.70	1.66	2140.1	2.49	2.50	2.50	1090.1	1.91	1.92	1.92
2083.4	2213.4	1.72	1.68	1.63	2220.1	2.44	2.44	2.44	1130.1	1.92	1.93	1.93
2163.1	2293.1	1.69	1.64	1.60	2300.1	2.41	2.41	2.40	1190.1	2.03	2.04	2.05
2242.9	2372.9	1.62	1.58	1.54	2380.1	2.41	2.41	2.39	1230.1	2.07	2.08	2.10
2322.6	2452.6	1.55	1.51	1.48	2460.1	2.46	2.46	2.44	1290.1	2.11	2.13	2.15
2402.4	2532.4	1.48	1.45	1.41	2540.1	2.53	2.53	2.52	1330.1	2.10	2.12	2.14
2482.1	2612.1	1.42	1.39	1.35	2620.1	2.60	2.59	2.59	1390.1	2.15	2.18	2.20
2561.8	2691.8	1.37	1.34	1.32	2700.1	2.67	2.66	2.66	1430.1	2.12	2.14	2.17
2641.6	2771.6	1.32	1.30	1.28	2780.1	2.71	2.69	2.66	1490.1	2.21	2.24	2.28
2721.3	2851.3	1.33	1.31	1.31	2860.1	2.72	2.71	2.67	1530.1	2.22	2.25	2.29
2801.1	2931.1	1.38	1.38	1.39	2940.1	2.74	2.72	2.69	1590.1	2.29	2.33	2.37
2880.8	3010.8	1.48	1.50	1.52	3020.1	2.77	2.76	2.74	1630.1	2.33	2.36	2.41
2960.6	3090.6	1.60	1.63	1.68	3100.1	2.79	2.78	2.78	1690.1	2.46	2.51	2.56
3040.3	3170.3	1.73	1.76	1.81	3180.1	2.78	2.78	2.78	1730.1	2.50	2.55	2.60
3100.1	3230.1	1.81	1.86	1.92	3240.1	2.71	2.69	2.65	1790.1	2.55	2.59	2.63

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101012
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Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	46	57	71	70	>73	>73	68	>73	68
1	-	9	+0	53	48	67	>73	>73	72	>73	>73	>73
2	75	23	21	36	66	72	>73	>73	71	70	67	>73
3	>90	42	23	53	69	68	>73	71	>73	72	>73	71
4	>90	43	41	48	68	>73	>73	65	>73	>73	>73	67
5	>90	51	47	56	>73	69	>73	>73	72	>73	70	>73
6	>90	67	64	62	68	>73	>73	>73	>73	69	67	>73
7	82	55	>73	>73	70	>73	70	>73	>73	>73	>73	73
8	>90	>73	70	72	>73	72	73	>73	>73	71	72	70
9	>90	69	>73	69	>73	>73	>73	>73	>73	>73	>73	>73
10	>90	>73	66	72	70	71	71	>73	72	>73	>73	71
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 1100 MHz; 5.00 dBm.
LO IN: 1230 MHz; +21.00 dBm
IF OUT: 130 MHz; -17.29 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	15	47	59	74	>76	>76	>76	>76	>76	>76
1	-	6	+0	49	50	70	72	>76	73	70	>76	>76
2	59	14	15	36	>76	72	>76	>76	75	>76	>76	>76
3	86	28	18	52	67	75	>76	75	>76	>76	71	>76
4	79	36	23	46	60	73	>76	>76	>76	>76	>76	72
5	58	48	33	50	64	69	>76	74	72	>76	>76	>76
6	64	39	37	59	64	75	>76	>76	>76	>76	>76	>76
7	>90	50	57	54	75	68	>76	>76	>76	>76	>76	>76
8	>90	53	51	74	73	>76	>76	>76	>76	>76	71	>76
9	87	51	73	60	73	>76	>76	74	>76	>76	>76	75
10	87	56	63	73	75	>76	>76	>76	>76	>76	>76	>76
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

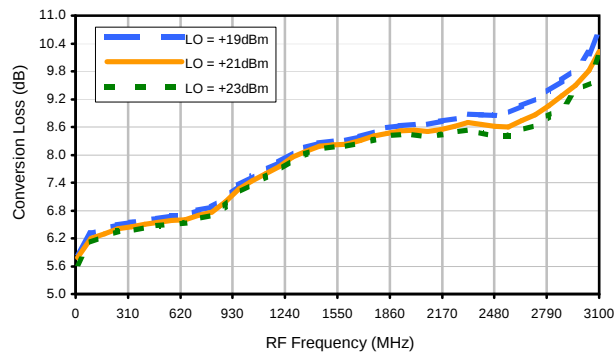
Test conditions:

RF IN: 1100 MHz; 15.00 dBm.
LO IN: 1230 MHz; +21.00 dBm
IF OUT: 130 MHz; -14.31 dBm

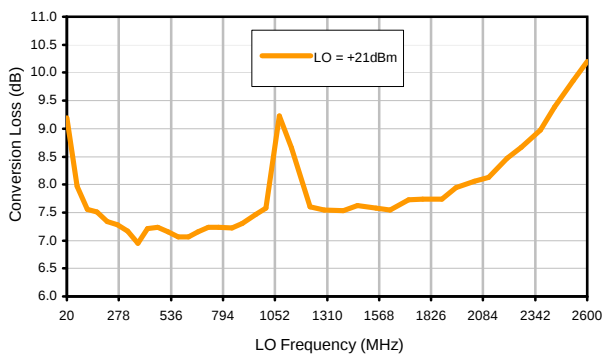
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

Typical Performance Curves

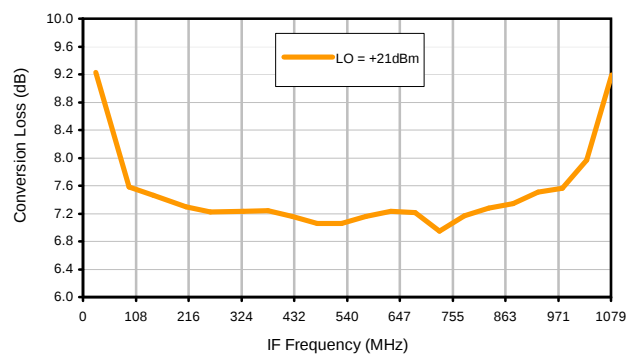
Conversion Loss @ IF=130MHz



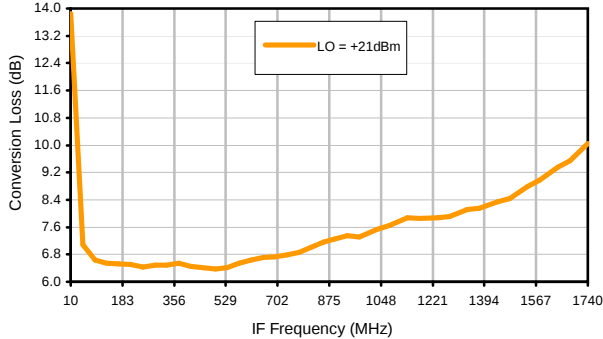
Conversion Loss vs. LO @ RF=1100MHz



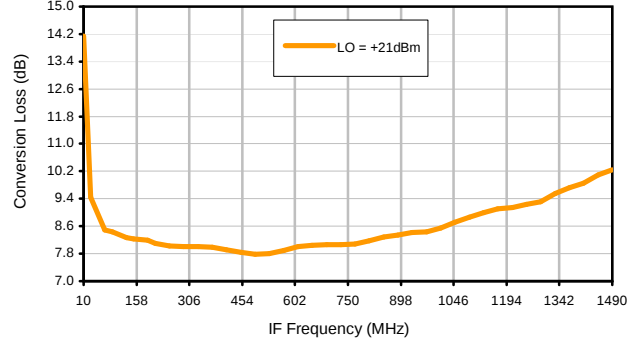
Conversion Loss vs. IF @ RF=1100MHz



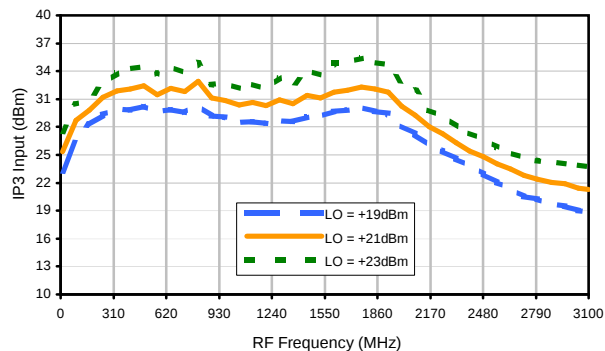
Conversion Loss vs. IF @ RF=460MHz



Conversion Loss vs. IF @ RF=1730.1MHz

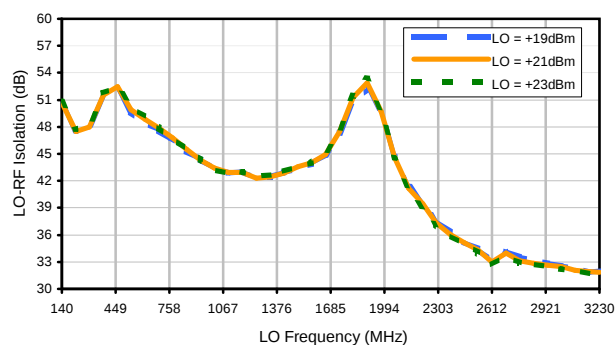


IP3 Input

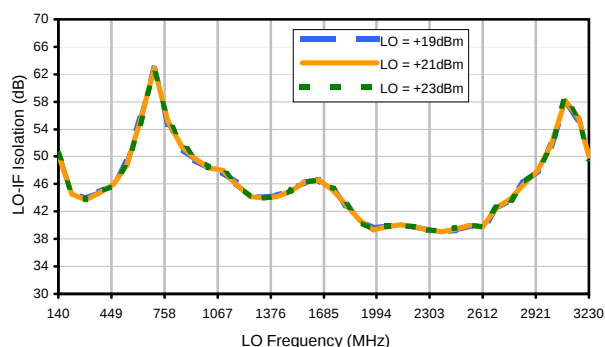


Typical Performance Curves

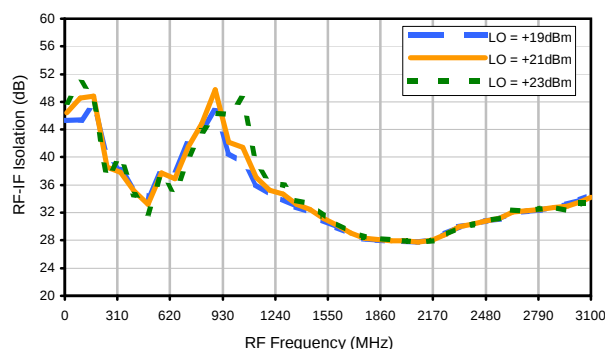
LO-RF Isolation



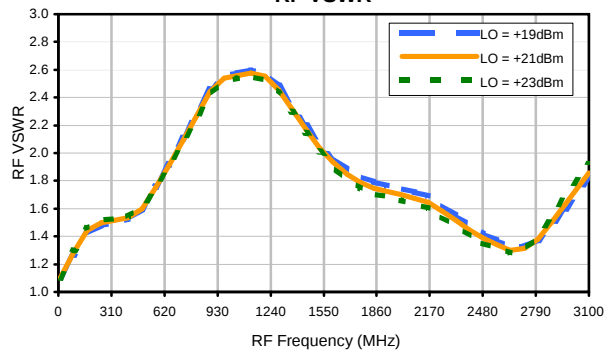
LO-IF Isolation



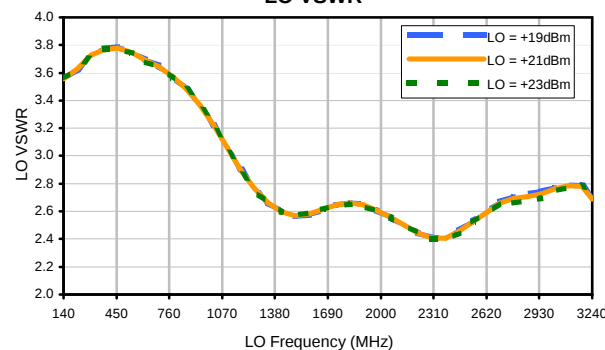
RF-IF Isolation



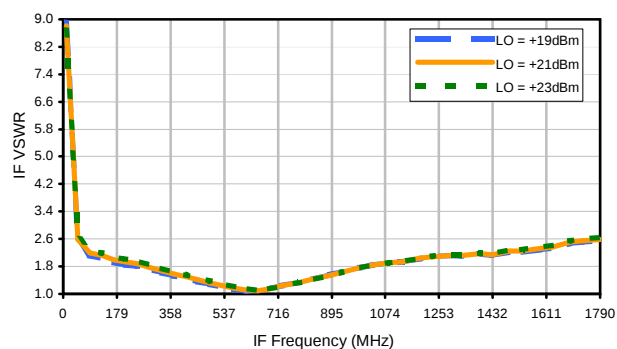
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	17	46	57	71	70	>73	>73	68	>73	68
1	-	9	+0	53	48	67	>73	>73	72	>73	>73	>73
2	75	23	21	36	66	72	>73	>73	71	70	67	>73
3	>90	42	23	53	69	68	>73	71	>73	72	>73	71
4	>90	43	41	48	68	>73	>73	65	>73	>73	>73	67
5	>90	51	47	56	>73	69	>73	>73	72	>73	70	>73
6	>90	67	64	62	68	>73	>73	>73	>73	69	67	>73
7	82	55	>73	>73	70	>73	70	>73	>73	>73	>73	73
8	>90	>73	70	72	>73	72	73	>73	>73	71	72	70
9	>90	69	>73	69	>73	>73	>73	>73	>73	>73	>73	>73
10	>90	>73	66	72	70	71	71	>73	72	>73	>73	71
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 1100 MHz; 5.00 dBm.
LO IN: 1230 MHz; +21.00 dBm
IF OUT: 130 MHz; -17.29 dBm

RF HARMONICS ORDER

	(-dBm)	(-dBc)										
0	-	-	15	47	59	74	>76	>76	>76	>76	>76	>76
1	-	6	+0	49	50	70	72	>76	73	70	>76	>76
2	59	14	15	36	>76	72	>76	>76	75	>76	>76	>76
3	86	28	18	52	67	75	>76	75	>76	>76	71	>76
4	79	36	23	46	60	73	>76	>76	>76	>76	>76	72
5	58	48	33	50	64	69	>76	74	72	>76	>76	>76
6	64	39	37	59	64	75	>76	>76	>76	>76	>76	>76
7	>90	50	57	54	75	68	>76	>76	>76	>76	>76	>76
8	>90	53	51	74	73	>76	>76	>76	>76	>76	71	>76
9	87	51	73	60	73	>76	>76	74	>76	>76	>76	75
10	87	56	63	73	75	>76	>76	>76	>76	>76	>76	>76
	RF CAL	0	1	2	3	4	5	6	7	8	9	10

LO HARMONICS ORDER

Test conditions:

RF IN: 1100 MHz; 15.00 dBm.
LO IN: 1230 MHz; +21.00 dBm
IF OUT: 130 MHz; -14.31 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.

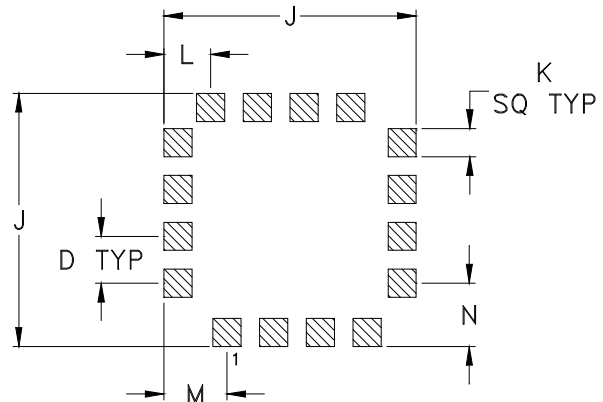
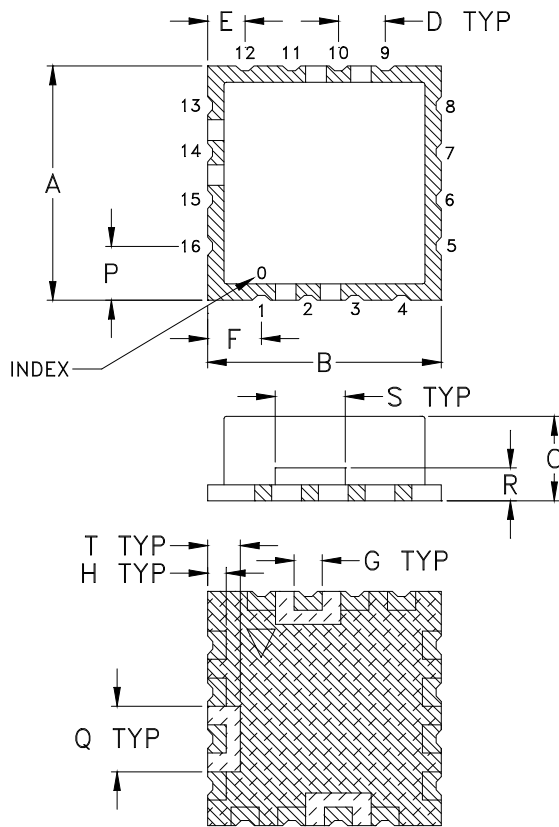
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Outline Dimensions

CK605

PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K
CK605	.500 (12.70)	.500 (12.70)	.180 (4.57)	.100 (2.54)	.080 (2.03)	.115 (2.92)	.060 (1.52)	.040 (1.02)	.540 (13.72)	.060 (1.52)

CASE #	L	M	N	P	Q	R	S	T	WT. GRAM
CK605	.100 (2.54)	.135 (3.43)	.135 (3.43)	.115 (2.92)	.140 (3.56)	.070 (1.78)	.150 (3.81)	.070 (1.78)	1.2 +0.5 -0.0

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .03$; 3Pl. $\pm .015$

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:
For RoHS Case Styles: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
All models, (+) suffix.



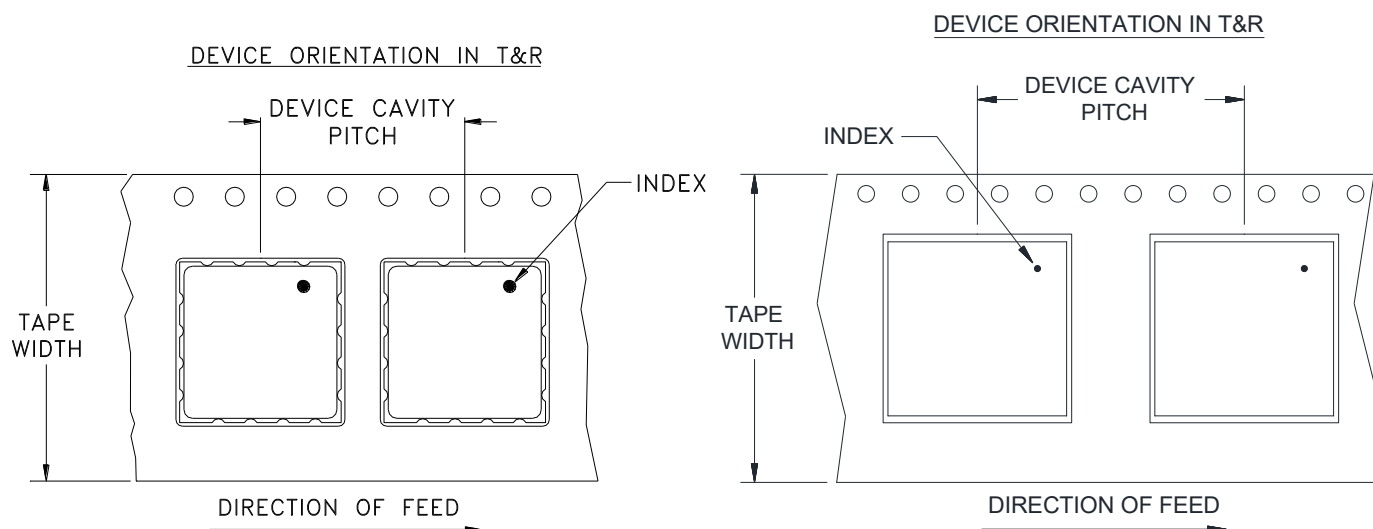
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F37



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	16	7	Small quantity standards (see note)	10
				20
				50
				100
		13	Standard	200
				500

Note: Please consult individual model data sheet to determine device per reel availability.

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



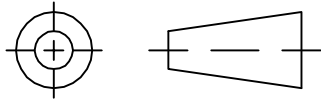
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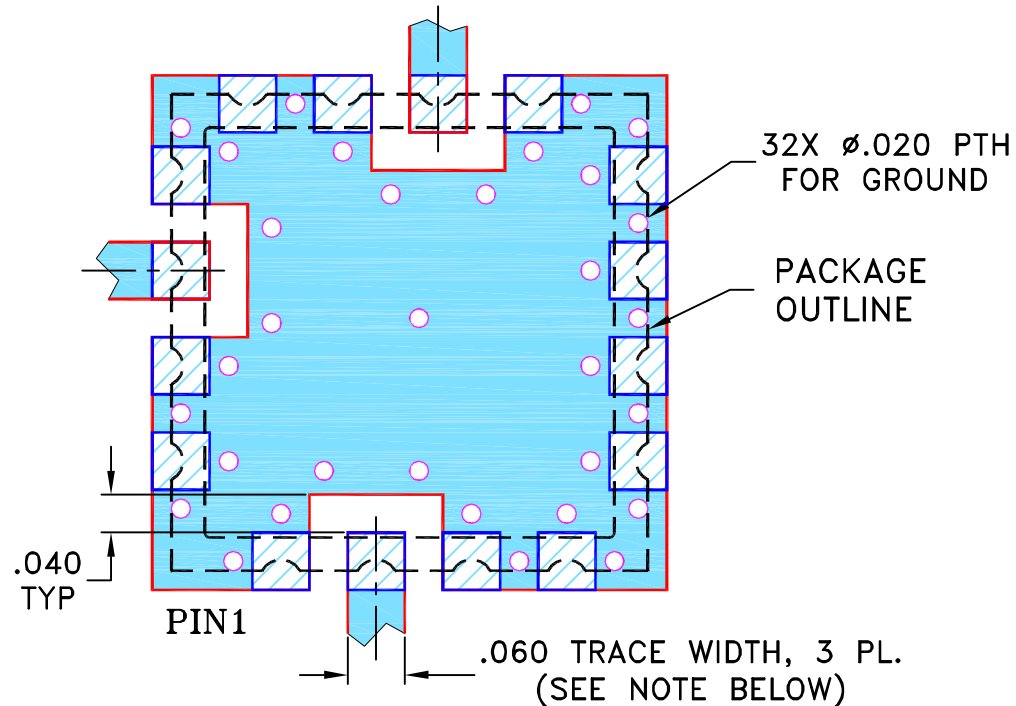
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
E	M105563	ADDED "rl" PIN CONNECTION	06/02/06	MMG	DJ
F	M105640	CORRECTED NOTE 2	06/08/06	MMG	MM
G	M124395	ADDED "RAMP"	09/09	EM	HH
G	R77589	ADDED "RAMP"	09/09	EM	HH

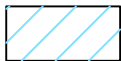
SUGGESTED MOUNTING CONFIGURATION FOR
CK605 CASE STYLE, "kg/rl/16AM01" PIN CONNECTION

NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .030" $\pm$.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE BOTTOM 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 $\pm$ 3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

DRAWN

AV

08/07/00

CHECKED

SK

08/08/00

APPROVED

DB

08/08/00

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



Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

PL,kg/rl/16AM01,CK605,ROS/LAVI/RAMP

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-012

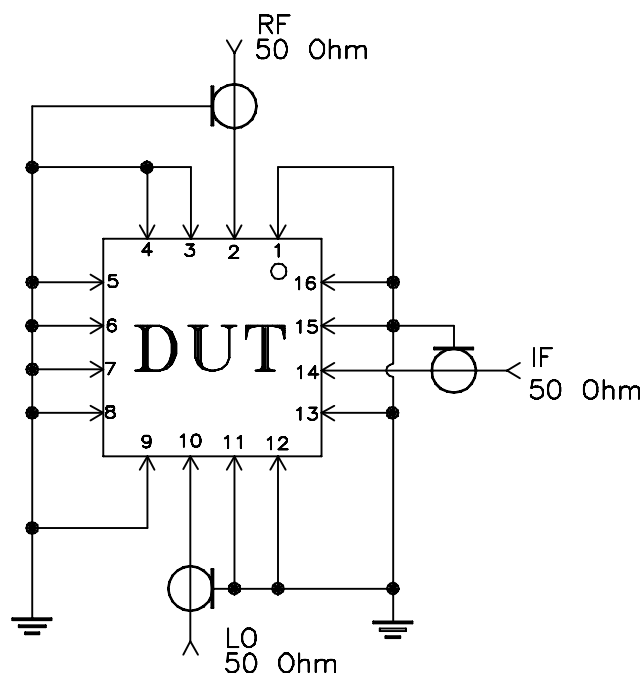
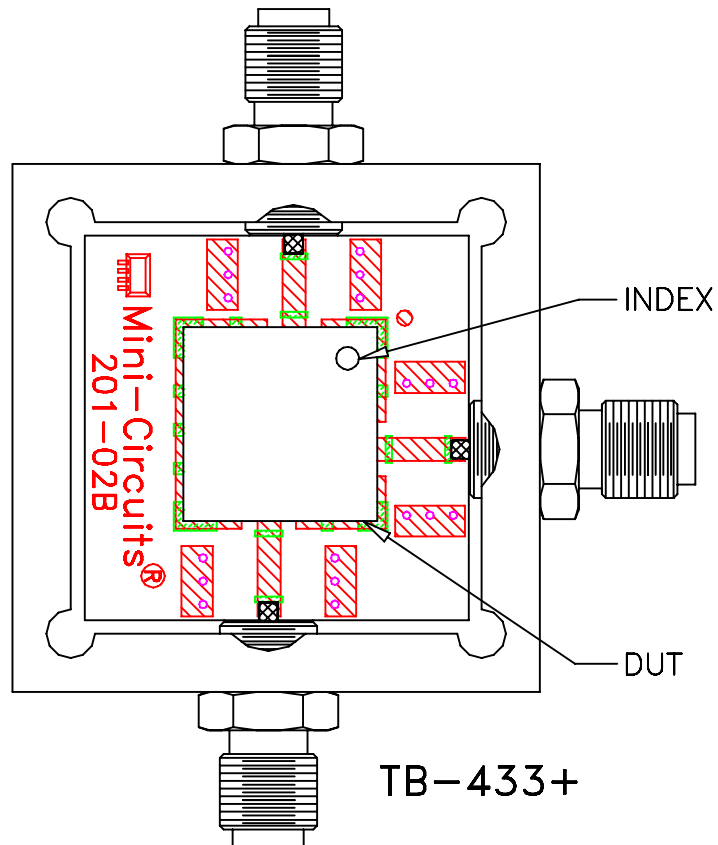
REV:
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FILE: 98PL012

SCALE: 5:1

SHEET: 1 OF 1

Evaluation Board and Circuit



Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.028 inch.

Schematic Diagram

 **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	-45° 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 Eutectic Process: 225°C peak Pb-Free Process, 245°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