

# Ceramic, Hermetically Sealed Frequency Mixer WIDE BAND

## MAC-60LH+

Level 10 (LO Power+10 dBm) 1600 to 6000 MHz

### Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	50 mW
IF Current	40 mA

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

### Pin Connections

LO	10
RF	5
IF	3
GROUND	1,2,4,6,7,8,9

### Features

- wide bandwidth, 1600 to 6000 MHz
- low conversion loss, 6.5 dB typ.
- excellent L-R isolation, 35 dB typ.
- LTCC double balanced mixer
- aqueous washable
- low cost
- low profile, 0.060"
- protected by US Patent 7,027,795

### Applications

- PCN
- defense and weather radar
- WCDMA
- defense communications



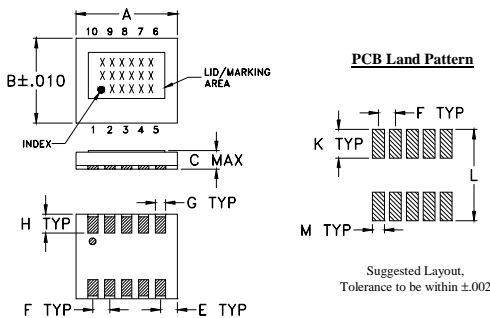
CASE STYLE: DZ1650  
PRICE: \$7.45 ea. QTY (10)

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

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

Reel Size	Available Tape and Reel at no extra cost Devices/Reel
7"	10, 20, 50, 100, 200, 500
13"	1000

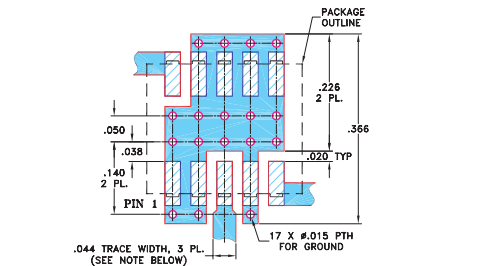
### Outline Drawing



### Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	wt
.30	.250	.060	--	.050	.050	.030	
7.62	6.35	1.52	--	1.27	1.27	0.76	
H	J	K	L	M			grams
.056	--	.085	.270	.035			
1.42	--	2.16	6.86	0.89			0.29

### Demo Board MCL P/N: TB-144 Suggested PCB Layout (PL-045)



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; 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

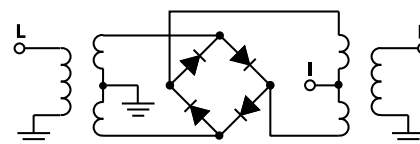
Parameter	Min.	Typ.	Max.	Unit
Frequency Range, RF/LO	1600	—	6000	MHz
Frequency Range, IF	DC	—	2000	MHz
Conversion Loss*	—	6.5	8.3	dB
LO to RF Isolation	21	35	—	dB
LO to IF Isolation	9	15	—	dB
IP3	—	12	—	dBm
RF Input Power at 1 dB Compression	—	+5	—	dBm

\*Conversion Loss at 30 MHz, increases with IF Frequency. See graphs.

### Typical Performance Data

Frequency (MHz)	Conversion Loss (dB)		Isolation L-R (dB)		Isolation L-I (dB)		VSWR RF Port (:1)		VSWR LO Port (:1)	
	LO	LO +10dBm	LO	LO +10dBm	LO	LO +10dBm	LO	LO +10dBm	LO	LO +10dBm
1600.1	1630.1	7.48	30.71	17.05	2.33	4.43				
1800.1	1830.1	6.39	33.36	18.01	2.75	2.68				
2000.1	2030.1	6.30	41.31	18.60	2.87	1.91				
2200.1	2230.1	5.74	35.09	18.42	2.46	1.97				
2400.1	2430.1	5.66	36.43	18.38	2.38	1.97				
2600.1	2630.1	5.60	34.39	18.40	1.81	2.03				
2800.1	2830.1	6.07	40.26	18.93	2.35	1.97				
3000.1	3030.1	6.33	37.80	18.99	2.96	2.04				
3200.1	3230.1	6.44	37.85	18.19	2.78	2.18				
3400.1	3430.1	6.62	36.28	16.06	2.88	2.30				
3600.1	3630.1	6.81	36.30	13.97	2.65	2.47				
3800.1	3830.1	6.37	36.44	14.05	2.47	2.57				
4000.1	4030.1	6.97	37.06	14.79	2.56	2.74				
4600.1	4630.1	5.85	32.74	19.89	1.64	2.37				
5000.1	5030.1	6.38	31.45	23.17	2.53	1.51				
5200.1	5230.1	6.28	28.79	22.52	2.03	1.20				
5400.1	5430.1	6.09	25.46	20.52	2.03	1.41				
5600.1	5630.1	5.95	25.79	18.13	1.70	1.99				
5800.1	5830.1	6.16	24.02	12.28	1.32	2.88				
6000.1	6030.1	7.06	27.32	11.83	1.36	4.89				

### Electrical Schematic



**Mini-Circuits**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED

For detailed performance specs & shopping online see web site

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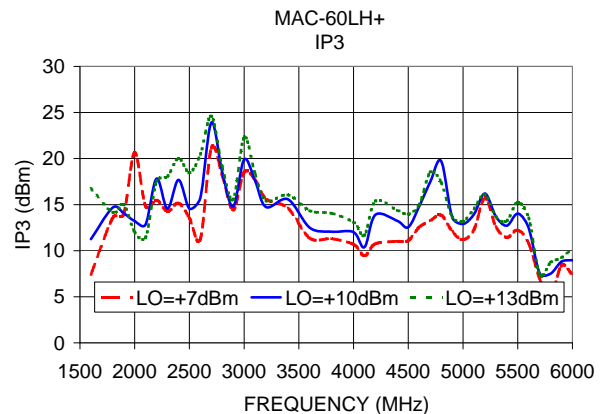
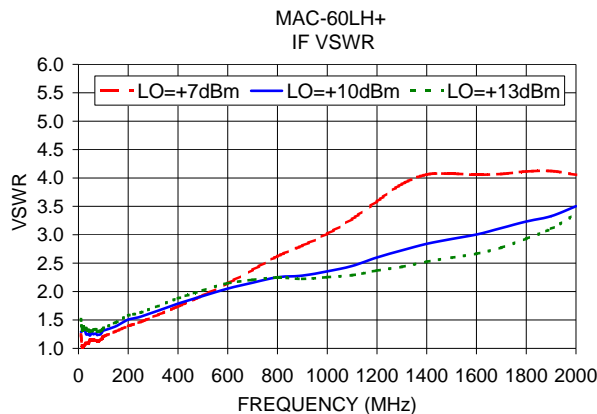
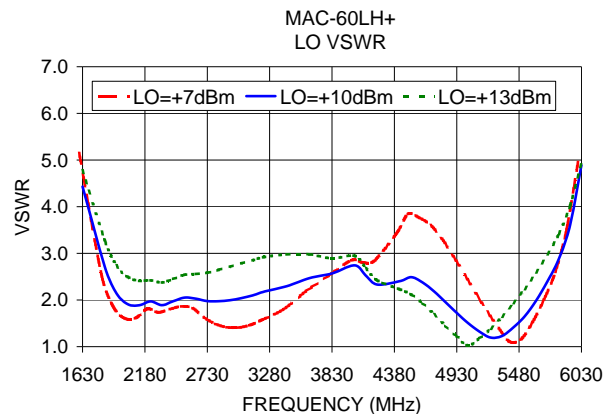
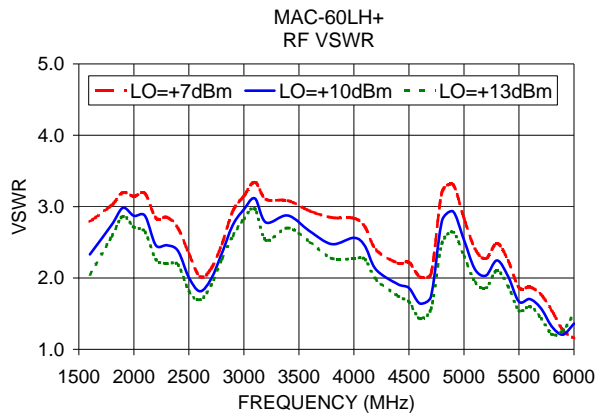
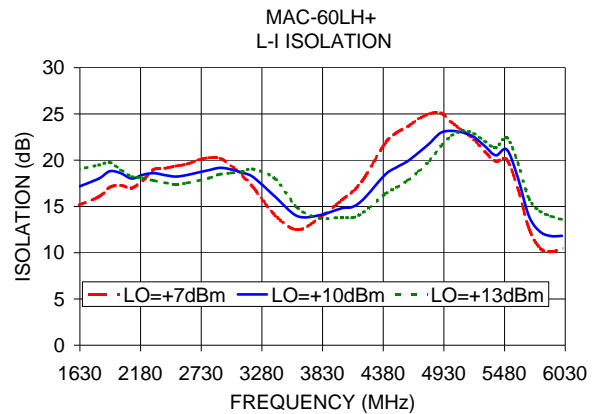
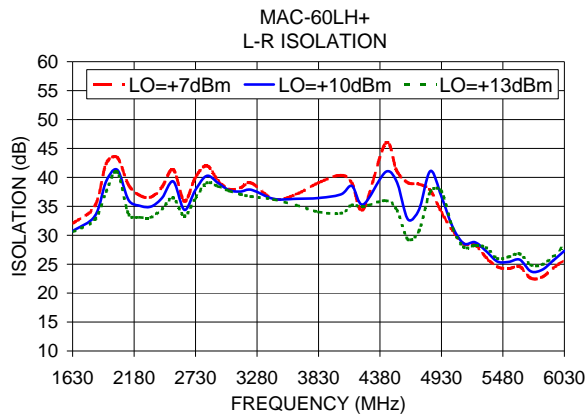
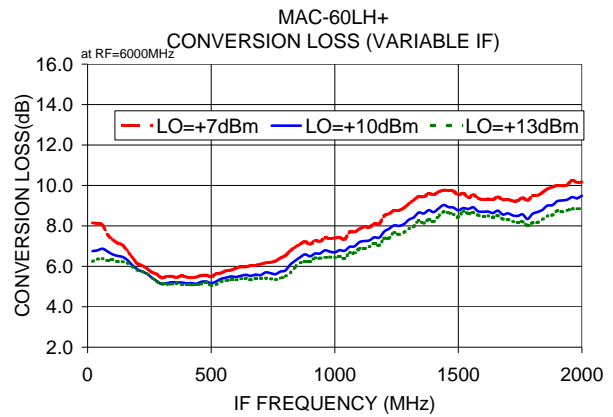
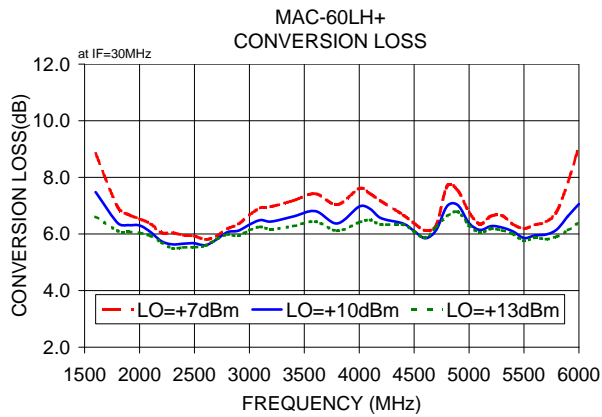
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# Performance Charts

# MAC-60LH+



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