

**ULTRA-REL<sup>®</sup>**  
**CERAMIC MIXERS**  
*300 MHz to 12 GHz*



*The Most Reliable Mixers In Today's Marketplace*

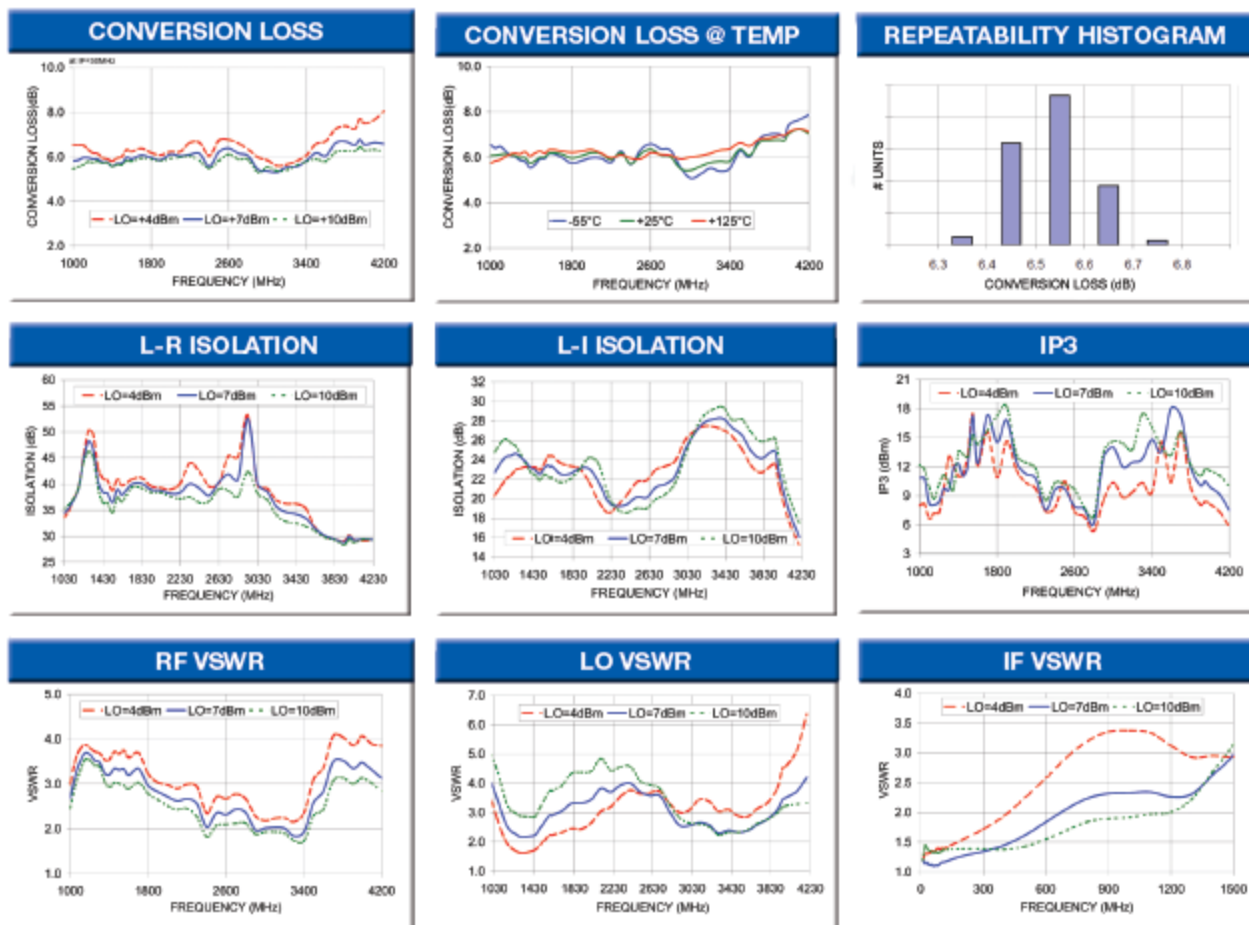
**3-YEAR GUARANTEE**

*Mini-Circuits...we're redefining what VALUE is all about!*

 **Mini-Circuits<sup>®</sup>**

## Excellent Electrical Performance for CRITICAL APPLICATIONS

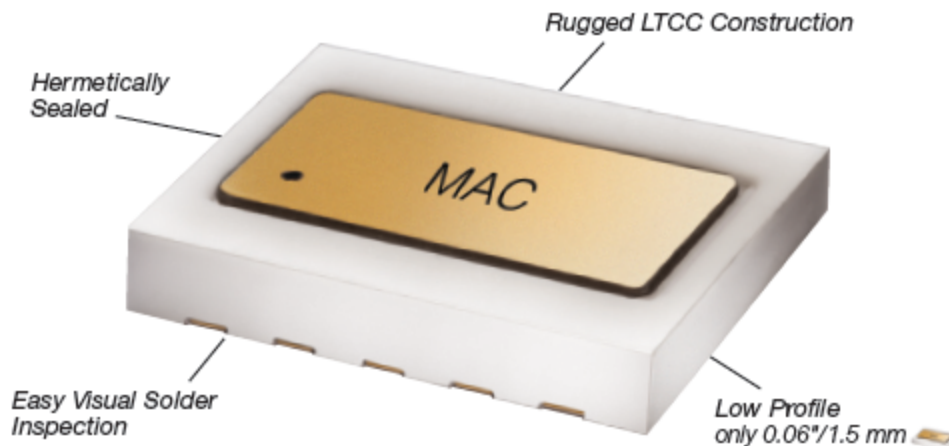
Typical Performance Curves (MAC 42+ shown, see [minicircuits.com](http://minicircuits.com) for other models)



*There's much more* to Mini-Circuits Ultra-Rel<sup>®</sup> Ceramic Mixers than just a rugged case—designed and built not only to survive, they deliver *excellent electrical performance in a consistent manner* throughout a product's life cycle: across the entire frequency range, at temperatures from -55 to +125°C, and from unit to unit and lot to lot.

It's what makes these mixers ideal, not only for military use, but anywhere long-term reliability adds bottom-line value: high moisture areas, busy production lines, high-speed distribution centers, heavy industry, outdoor settings, and unmanned facilities, to name just a few. For more information, from technical specifications to performance data, environmental ratings, export info, application notes, pricing, real-time availability, and more, just go to [minicircuits.com](http://minicircuits.com) and make your selection today!

## Designed and Built for Long-Term Reliability in **HOSTILE ENVIRONMENTS**



### *Mini-Circuits MAC mixers meet or exceed the following qualifications:*

<b>Gross Leak</b>	MIL-STD-202 Method 112, Condition D (100% of all MAC Mixers we ship)
<b>Fine Leak</b>	MIL-STD-202 Method 112, Condition C, Procedure IIIa
<b>Thermal Shock</b>	MIL-STD-202 Method 107 (-55/+100°C, 1000 cycles, 15 minutes) (-55/+150°C, 1000 cycles, 15 minutes)
<b>Vibration</b>	MIL-STD-202 Method 204, Condition D (10-2000Hz sine, 20g, 3 axis, 12 c.y.ea.)
<b>Acceleration</b>	MIL- STD-883 Method 2001, Condition E
<b>Mechanical Shock</b>	MIL-STD-202 Method 213, Condition A
<b>HTOL</b>	MIL-STD-202 Method 108, Condition D (1000 hours, 125°C, at rated LO level)
<b>Multiple Reflow</b>	JESD22-B102
<b>Bend Test</b>	JESD22-B113
<b>Adhesion Strength</b>	Push test >10lb



All Photos courtesy of U.S. Military and NASA

# ULTRA·REL<sup>®</sup> Ceramic Mixers

Meet the demands of  
**Your HOSTILE ENVIRONMENT**



Photocourtesy of  
U.S. Military and NASA

Aerospace • Military • Outdoor • Industrial • Instrumentation

Model	LO Level (dBm)	Frequency (GHz)	Conv. Loss (dB)	Isolation L-R (dB)	Price \$ ea. (qty. 10)
MAC-24+	7	0.3-2.4	6.1	40	5.95
MAC-24LH+	10				
MAC-24MH+	13				
MAC-42+	7	1.0-4.2	6.1	35	6.95
MAC-42LH+	10				
MAC-42MH+	13				
MAC-60+	7	1.6-6.0	6.5	35	7.45
MAC-60LH+	10				
MAC-60MH+	13				
MAC-80LH+	10	2.8-8.0	5.8	29	7.95
MAC-80MH+	13		5.8		7.95
MAC-80H+	17		6.5		8.95
MAC-85L+	4	2.8-8.5	7.0	31	7.95
MAC-85+	7		6.1		
MAC-113H+	17	3.8-11	6.5	28	11.95
MAC-12GL+	4	3.8-12	6.6	26	8.95
MAC-12G+	7		6.3		

Go to [minicircuits.com](http://minicircuits.com) for technical specifications, performance data, pricing, and real-time, in-stock availability!

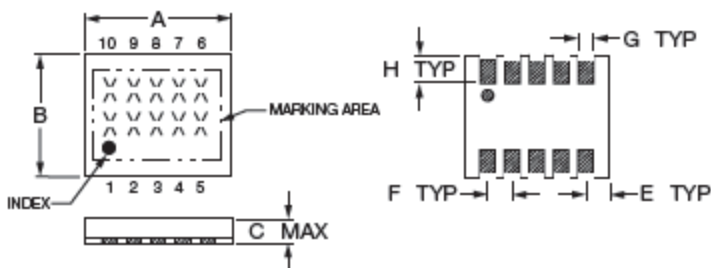
#### Outline Dimensions (inch)

A	B	C	E	F	G	H
.30	.250	.060	.050	.060	.030	.056
7.62	6.35	1.52	1.27	1.27	0.76	1.42

Weight 0.23 grams

#### Pin Connections

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



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ISO 9001 ISO 14001 AS9100

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The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see [minicircuits.com](http://minicircuits.com)

7732205, 7761442

IF/RF MICROWAVE COMPONENTS

ULTRAMIX4P-2