

# RF Transformer

**MTX2-73+**

50Ω 2000 to 7000 MHz

## The Big Deal

- Wideband, 2000 to 7000 MHz
- Low insertion loss, 0.6 dB to 6000 MHz
- Low unbalance, 0.8 dB, 4°
- Power handling up to +34 dBm



CASE STYLE: DQ1225

## Product Overview

Mini-Circuits MTX2-73+ is a wideband MMIC balun transformer with an impedance ratio of 2:1 covering a wide range of applications from 2000 to 7000 MHz. Fabricated using IPD process technology, this model provides outstanding repeatability with low insertion loss, low amplitude unbalance, low phase unbalance, and RF input power handling up to +34 dBm (2.5W). The unit comes housed in a tiny 3 x 3 x 0.89mm QFN package with low inductance, excellent thermal efficiency, and high ESD rating.

## Key Features

Feature	Advantages
Wideband, 2000 to 7000 MHz	MTX2-73+ supports a broad variety of applications including WLAN, WiMAX, WiBRO, ISM, radar and more.
Low insertion loss <ul style="list-style-type: none"> <li>• 0.6 dB, 2600 to 6000 MHz</li> <li>• 1.9 dB, 2000 to 7000 MHz</li> </ul>	Enables excellent signal power transmission from input to output.
Low unbalance <ul style="list-style-type: none"> <li>• 0.8 dB amplitude unbalance</li> <li>• 4° phase unbalance</li> </ul>	Low unbalance can improve a system's electromagnetic compatibility by rejecting unwanted common-mode noise.
Tiny size, 3 x 3 x 0.89mm	Accommodates tight space requirements for dense PCB layouts.

# MMIC Balun RF Transformer

## MTX2-73+

50Ω 2000 to 7000 MHz

### Features

- wideband, 2000 to 7000 MHz
- low phase unbalance, 4 deg. and amplitude unbalance, 0.8 dB typ.
- miniature size, (3 x 3 x 0.89 mm)
- low cost
- aqueous washable



CASE STYLE: DQ1225

### +RoHS Compliant

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

### Applications

- WLAN
- WiMAX/WIBRO
- ISM
- RADAR

### Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (secondary/ primary)			2		
Frequency Range		2000	—	7000	MHz
Insertion Loss*	2600 - 6000	—	0.6	1.0	dB
	2000 - 7000	—	1.9	2.3	
Amplitude Unbalance	2600 - 6000	—	0.5	0.9	dB
	2000 - 7000	—	0.8	1.2	
Phase Unbalance†	2600 - 6000	—	3	5	Degree
	2000 - 7000	—	4	7	

\* Insertion Loss is referenced to mid-band loss, 1.5 dB.

† Relative to 180°

### Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Input RF Power	34 dBm at 25°C

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

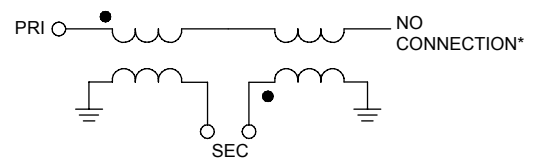
ESD rating

Human body model (HBM): Class 1B (500 to <1000V) in accordance with ANSI/ESD 5.1-2007

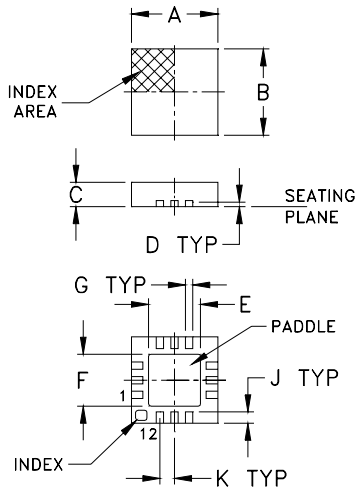
### Pad Connections

Function	Pad Number
PRIMARY DOT (Unbalanced Port)	2
SECONDARY DOT (Balanced)	9
SECONDARY (Balanced)	7
EXTERNAL GND	1,3,6,8 & paddle
NO CONNECTION	all other

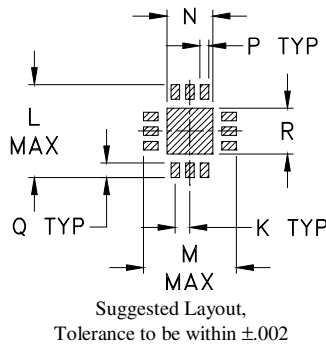
### Configuration J



## Outline Drawing



## PCB Land Pattern



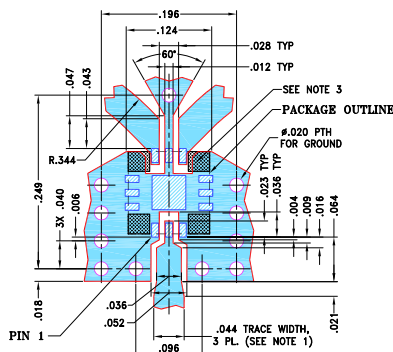
## Product Marking



## Outline Drawing Dimensions (inch mm)

A	B	C	D	E	F	G	H	J
.118	.118	.035	.008	.057	.057	.009	---	.016
3.00	3.00	0.89	0.20	1.45	1.45	0.23	---	0.41
K	L	M	N	P	Q	R	wt	
.020	.127	.127	.049	.010	.020	.049	grams	
0.51	3.23	3.23	1.24	0.25	0.51	1.24	0.02	

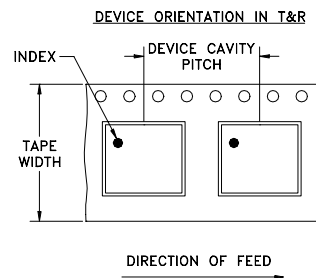
## Demo Board MCL P/N: TB-453-MTX273+ Suggested PCB Layout (PL-482)



### NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS  $.020" \pm .0015"$ ; 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.
  - SIGNAL TRACES ARE NOT ALLOWED INSIDE HATCHED AREAS (APPROX.  $.030" \times .030"$ ) AT 4 PLACES AS SHOWN.
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## Tape and Reel (F66)



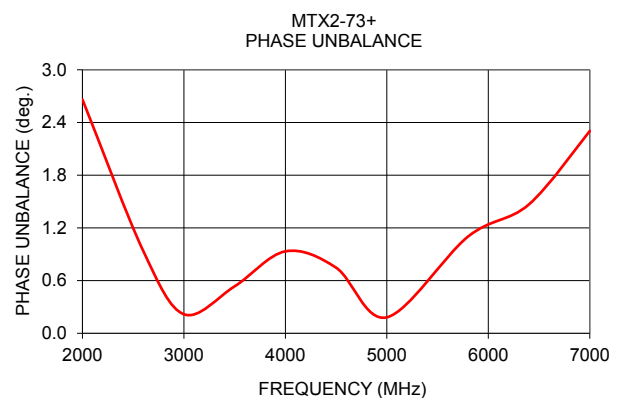
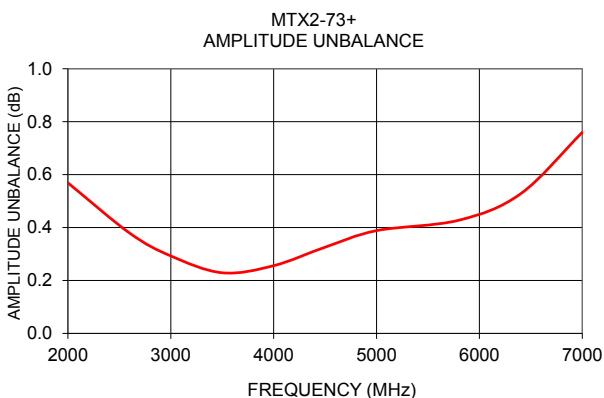
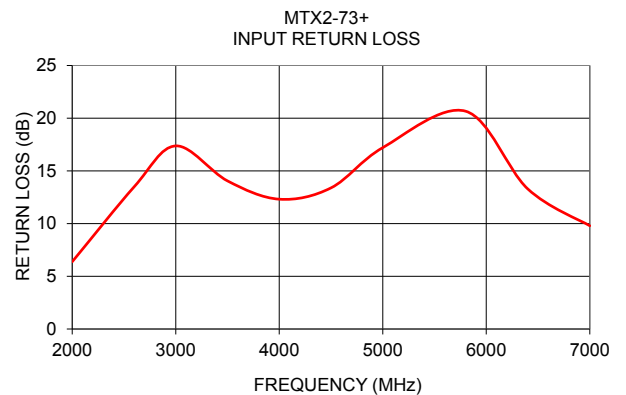
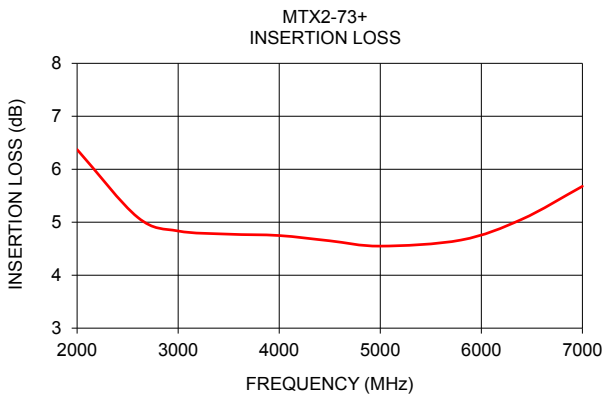
Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
8	4	7	Small quantity standard	20
				50
8	4	7	Standard	200
				500
		7		1000, 2000

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.

## Typical Performance Data at 25°C

FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT R. LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (Deg.)
2000	6.37	6.39	0.57	2.66
2600	5.09	13.51	0.38	0.94
3000	4.83	17.37	0.29	0.22
3500	4.77	14.05	0.23	0.53
4000	4.75	12.32	0.26	0.93
4500	4.65	13.39	0.33	0.75
5000	4.55	17.21	0.39	0.18
6000	4.77	17.48	0.45	1.23
6400	5.05	13.30	0.53	1.47
7000	5.68	9.80	0.76	2.30



### Additional 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-Circuits' applicable established test performance criteria and measurement instructions.
- 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](http://www.minicircuits.com/MCLStore/terms.jsp)