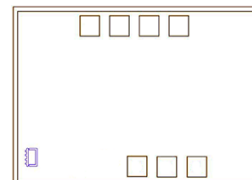


50Ω 2000 to 7000 MHz

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



Product Overview

Mini-Circuits MTX2-73-D+ is a wideband MMIC balun transformer die with an impedance ratio of 2:1 covering a wide range of applications from 2000 to 7000 MHz. Fabricated using GaAs HBT 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).

Key Features

Feature	Advantages
Wideband, 2000 to 7000 MHz	MTX2-73-D+ supports a broad variety of applications including WLAN, WiMAX, WiBRO, ISM, radar and more.
Low insertion loss <ul style="list-style-type: none"> • 0.6 dB, 2600 to 6000 MHz • 1.9 dB, 2000 to 7000 MHz 	Enables excellent signal power transmission from input to output.
Low unbalance <ul style="list-style-type: none"> • 0.8 dB amplitude unbalance • 4° phase unbalance 	Low unbalance can improve a system's electromagnetic compatibility by rejecting unwanted common-mode noise.
Unpackaged Die	Enables the user to integrate the balun directly into hybrids.

RF Transformer Die

MTX2-73-D+

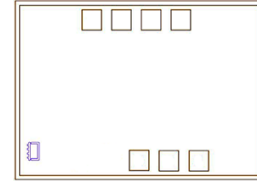
50Ω 2000 to 7000 MHz

Product Features

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

Typical Applications

- WLAN
- WiMAX/WIBRO
- ISM
- RADAR



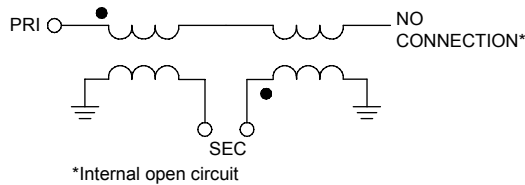
+RoHS Compliant
 The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Ordering Information: Refer to Last Page

General Description

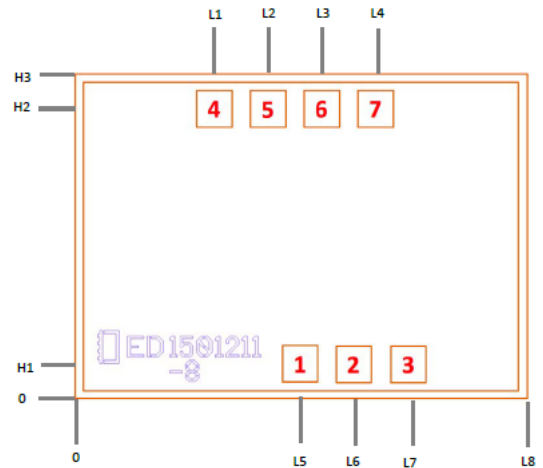
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Simplified Schematic and Pad description



Pad Number	Description
1,3,4,7	Ground
2	Primary Dot (Unbalanced)
5	Secondary DOT (Balanced)
6	Secondary (Balanced)

Bonding Pad Position



Die dimensions in μm

L1	L2	L3	L4	L5	L6	L7	L8	H1
384	534	684	834	623	773	923	1254	96
H2	H3	Thickness		Die size		Bond pad #1 to #9 Size		
804	900	100		1254 x 900		92 x 92		

Electrical Specifications¹ at 25°C, 50Ω, unless otherwise noted.

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (secondary / primary)			2		
Frequency Range		2000		7000	MHz
Insertion Loss ²	2600 - 6000		0.6		dB
	2000 - 7000		1.9		
Amplitude Unbalance	2600 - 6000		0.5		dB
	2000 - 7000		0.8		
Phase Unbalance ³	2600 - 6000		3		Degree
	2000 - 7000		4		

1. Measured on Mini-Circuits Characterization test board. Die is packaged in 3x3 mm, 12-lead MCL package and soldered on TB-453-MTX273+.

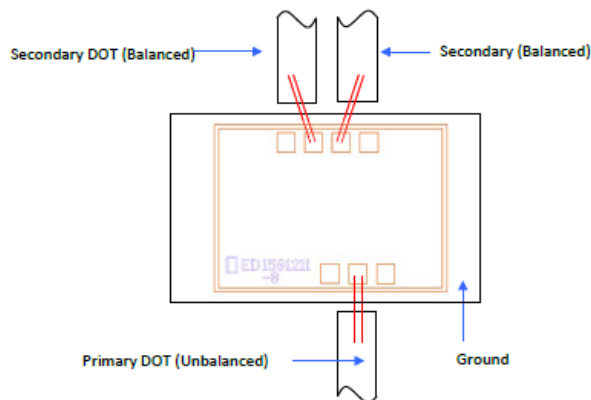
2. Insertion loss is referenced to mid-band loss, 1.5 dB.

3. Relative to 180°

Absolute Maximum Ratings²

Operating Case Temperature	-40°C to 85°C
RF Input Power	34 dBm at 25°C

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

Assembly Diagram**Assembly and Handling Procedure**

- Storage**
Dice should be stored in a dry nitrogen purged desiccators or equivalent.
- ESD**
MMIC GaAs HBT RF Transformer dice are susceptible to electrostatic and mechanical damage. Die are supplied in antistatic protected material, which should be opened in clean room conditions at an appropriately grounded anti-static workstation. Devices need careful handling using correctly designed collets, vacuum pickup tips or sharp antistatic tweezers to deter ESD damage to dice.
- Die Attach**
The die mounting surface must be clean and flat. Using conductive silver filled epoxy, recommended epoxies are DieMat DM6030HK-PT/H579 or Ablestik 84-1LMISR4. Apply sufficient epoxy to meet required epoxy bond line thickness, epoxy fillet height and epoxy coverage around total die periphery. Parts shall be cured in a nitrogen filled atmosphere per manufacturer's cure condition. It is recommended to use antistatic die pick up tools only.
- Wire Bonding**
Bond pad openings in the surface passivation above the bond pads are provided to allow wire bonding to the dice gold bond pads. Thermosonic bonding is used with minimized ultrasonic content. Bond force, time, ultrasonic power and temperature are all critical parameters. Suggested wire is pure gold, 1 mil diameter. Bonds must be made from the bond pads on the die to the package or substrate. All bond wires should be kept as short as low as reasonable to minimize performance degradation due to undesirable series inductance.

Additional Detailed Technical Information <i>additional information is available on our dash board.</i>									
Performance Data	Data Table								
	Swept Graphs								
	S-Parameter (S3P Files) Data Set with and without port extension(.zip file)								
Case Style	Die								
Die Ordering and packaging information	<table> <tr> <td>Quantity, Package</td> <td>Model No.</td> </tr> <tr> <td>Small, Gel - Pak: 5,10,50,100 KGD*</td> <td>MTX2-73-DG+</td> </tr> <tr> <td>Medium[†], Partial wafer: KGD*<1353</td> <td>MTX2-73-DP+</td> </tr> <tr> <td>Large[†], Full Wafer</td> <td>MTX2-73-DF+</td> </tr> </table> <p>[†]Available upon request contact sales representative</p> <p>Refer to AN-60-067</p>	Quantity, Package	Model No.	Small, Gel - Pak: 5,10,50,100 KGD*	MTX2-73-DG+	Medium [†] , Partial wafer: KGD*<1353	MTX2-73-DP+	Large [†] , Full Wafer	MTX2-73-DF+
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Large [†] , Full Wafer	MTX2-73-DF+								
Environmental Ratings	ENV80								

*Known Good Dice (“KGD”) means that the dice are taken from PCM good wafer and visually inspected. While this is not definitive, it does help to provide a higher degree of confidence that dice are capable of meeting typical RF electrical parameters specified by Mini-Circuits.

ESD Rating**

Human Body Model (HBM): Class 1B (Pass 500V) in accordance with ANSI/ESD STM 5.1 - 2001

** Tested in industry standard 3 x 3mm, 12-lead MCLP package

Additional Notes

- 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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