



MMIC BALUN

RF Transformer Die

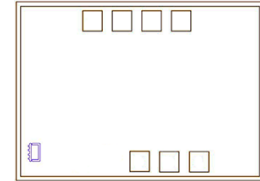
MTX2-73-D+

Mini-Circuits

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



+RoHS Compliant

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

SEE ORDERING INFORMATION ON THE LAST PAGE

APPLICATIONS

- WLAN
- WiMAX/WiBRO
- ISM
- RADAR

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 • 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 • 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.

REV. A
ECO-009930
MTX2-73-D+
RS/CP/AM
092921



**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 RATINGS

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

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



ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD.

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	Quantity, Package Small, Gel - Pak: 5,10,50,100 KGD* Medium†, Partial wafer: KGD*<1353 Large†, Full Wafer	Model No. MTX2-73-DG+ MTX2-73-DP+ MTX2-73-DF+
	†Available upon request contact sales representative Refer to AN-60-067	
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

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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS ⁽¹⁾ (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE ⁽²⁾ (deg.)
1500	6.16	2.80	0.76	4.54
1600	5.41	3.38	0.72	4.11
1700	4.77	4.02	0.68	3.70
1800	4.22	4.74	0.65	3.35
1900	3.76	5.53	0.61	2.98
2000	3.37	6.39	0.57	2.66
2100	3.05	7.34	0.53	2.34
2200	2.77	8.38	0.49	1.98
2300	2.55	9.51	0.47	1.69
2400	2.36	10.77	0.44	1.43
2500	2.21	12.11	0.41	1.17
2600	2.09	13.51	0.38	0.94
2700	2.00	14.96	0.35	0.71
2800	1.93	16.24	0.33	0.50
2900	1.87	17.11	0.31	0.36
3000	1.83	17.37	0.29	0.22
3100	1.81	17.04	0.28	0.02
3200	1.79	16.37	0.27	0.14
3300	1.78	15.56	0.25	0.29
3400	1.78	14.76	0.24	0.42
3500	1.77	14.05	0.23	0.53
3600	1.77	13.46	0.23	0.66
3700	1.77	13.02	0.23	0.75
3800	1.77	12.65	0.23	0.83
3900	1.76	12.44	0.24	0.89
4000	1.75	12.32	0.26	0.93
4100	1.73	12.34	0.27	0.97
4200	1.72	12.45	0.28	0.96
4300	1.69	12.68	0.29	0.89
4400	1.67	12.98	0.31	0.81
4500	1.65	13.39	0.33	0.75
4600	1.63	13.86	0.34	0.65
4700	1.61	14.52	0.36	0.47
4800	1.59	15.21	0.36	0.30
4900	1.57	16.11	0.37	0.24
5000	1.55	17.21	0.39	0.18
5100	1.54	18.52	0.41	0.08
5200	1.53	20.01	0.43	0.23
5300	1.53	21.65	0.42	0.50
5400	1.54	23.09	0.41	0.63
5500	1.56	23.95	0.42	0.75
5600	1.59	23.62	0.43	0.86
5700	1.62	22.45	0.43	0.99
5800	1.66	20.66	0.43	1.10
5900	1.71	19.02	0.44	1.19
6000	1.77	17.48	0.45	1.23
6100	1.83	16.27	0.46	1.25
6200	1.90	15.10	0.48	1.30
6300	1.97	14.18	0.50	1.41
6400	2.05	13.30	0.53	1.47
6500	2.14	12.59	0.56	1.59
6600	2.23	11.89	0.58	1.68
6700	2.33	11.27	0.63	1.76
6800	2.44	10.71	0.67	1.91
6900	2.56	10.21	0.72	2.11
7000	2.68	9.80	0.76	2.30
7100	2.80	9.45	0.81	2.47
7200	2.93	9.13	0.87	2.68
7300	3.06	8.87	0.94	3.01
7400	3.21	8.61	0.99	3.36
7500	3.36	8.38	1.04	3.72

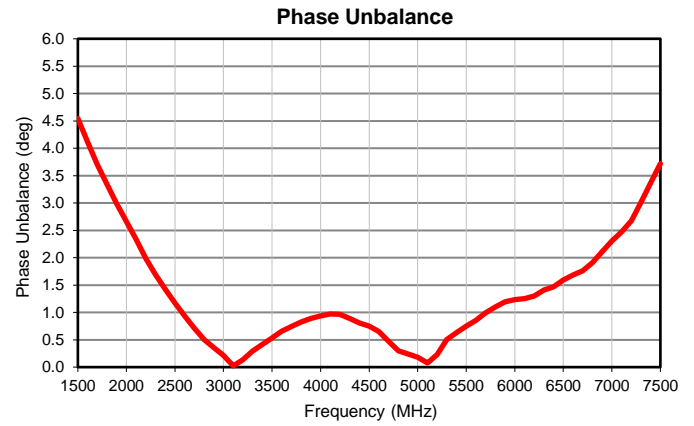
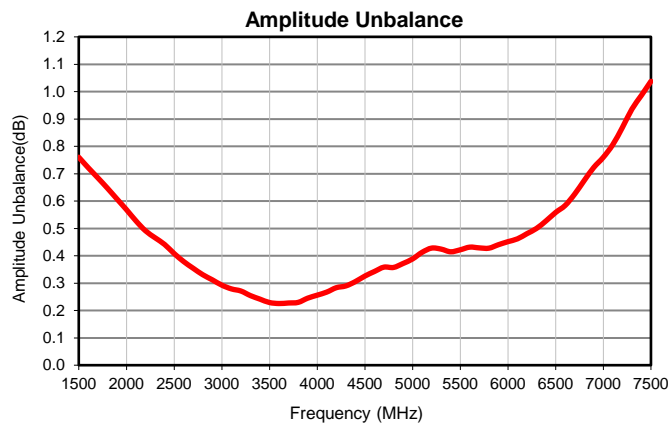
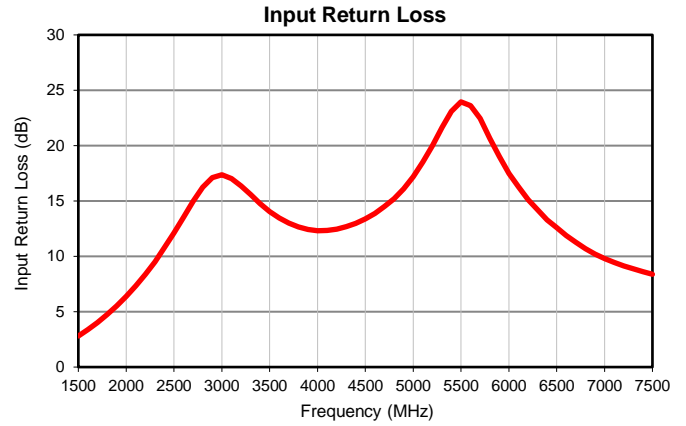
⁽¹⁾ Insertion Loss is referenced to mid-band loss, 1.5 dB

⁽²⁾ Relative to 180°

Note: Testdata of Die packaged in 3x3 mm, 12-lead MCL package



Typical Performance Data



Note: Testdata of Die packaged in 3x3 mm, 12-lead MCL package

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	-40° to 85° C or -40° to 105° C or -55° to 105° C or -45° to 105° C Ambient Environment	Refer to Individual Model Data Sheet
Storage Environment (Die)	-65° to 150°C	Individual Model Data Sheet
Storage Environment(Packaging)	-40° to 70°C and 40 to 60% humidity (In Factory Shipped Package)	