

E-Series RF 1:1 Transmission Line Transformer 4.5 - 3000 MHz

Rev. V7

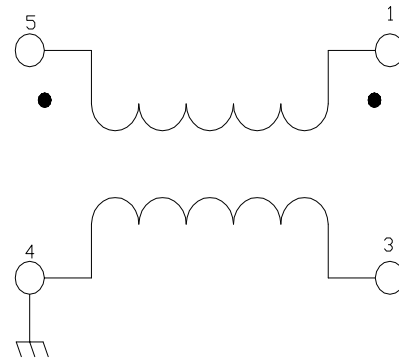
Features

- 1:1 Impedance ratio
- Surface mount
- Tape and reel packaging available

Description

M/A-COM's ETC1-1-13 is a 1:1 RF transmission line transformer in a low cost, surface mount package. Ideally suited for high volume cellular and wireless application. Parts are packaged in tape & reel

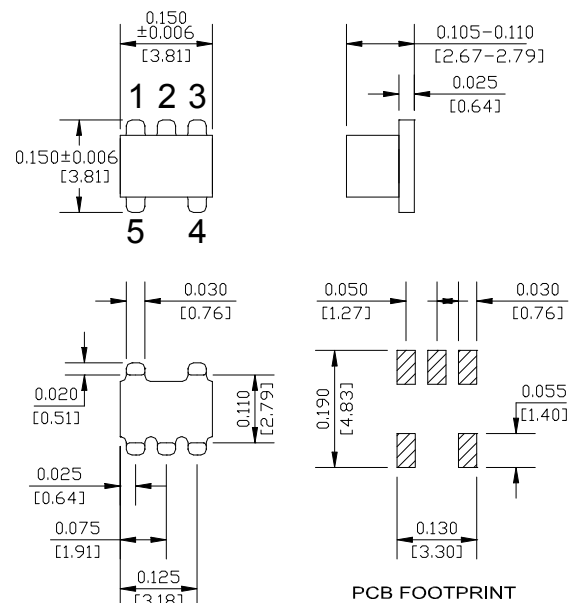
Schematic



Product Image



SM-22 package



Pin Configuration

Pin No.	Function
1	Secondary Dot
2	Not Connected
3	Secondary
4	Primary
5	Primary Dot

* Dimensions are inches (millimeters) ±0.015 (0.38) unless otherwise specified.

* Restrictions on Hazardous Substances, European Union Directive 2002/95/EC.

ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.

PRELIMINARY: Data Sheets contain information regarding a product M/A-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples and/or test data may be available. Commitment to produce in volume is not guaranteed.

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Electrical Specifications: $T_A = 25^\circ\text{C}$, $V_{\text{HIGH}} = 3.0\text{ V}$, $V_{\text{LOW}} = 0\text{ V}$, $Z_0 = 50\ \Omega$ ¹

Parameter	Test Conditions	Test Conditions	Units	Min	Typ	Max
RF Frequency	-	4.5 - 3000	MHz	-	-	-
Insertion Loss	-	4.5 - 1000	dB	-	0.32	1.0
		1000 - 2000	dB	-	-	2.0
		2000 - 3000	dB	-	-	3.5
Amplitude Unbalance	-	4.5 - 1000	dB	-	-	1.0
Phase Unbalance	-	4.5 - 1000	Degrees	-	-	20

1. External DC blocking capacitors are required on all RF ports (39 pF capacitors are recommended).

Absolute Maximum Ratings ^{2,3}

Parameter	Absolute Maximum
DC Power	250mW
DC Current	30mA
Operating Temperature	-55°C to +85°C
Storage Temperature	-55°C to +125°C

2. Exceeding any one or combination of these limits may cause permanent damage to this device.

3. M/A-COM does not recommend sustained operation near these survivability limits.

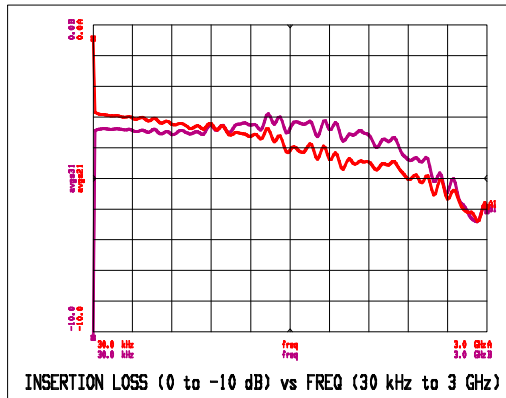
† Reference Application Note M538 for lead-free solder reflow recommendations.
 Meets JEDEC moisture sensitivity level 1 requirements.

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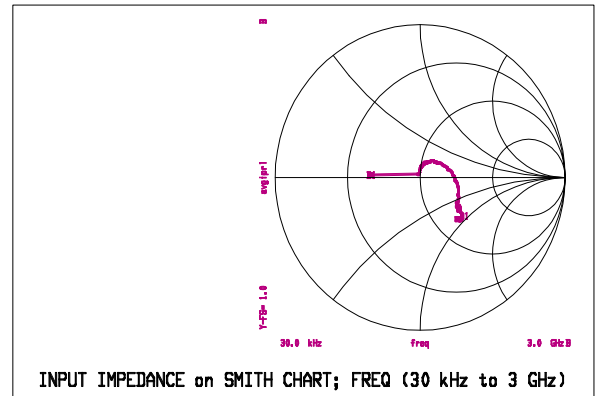
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Typical Performance Curves

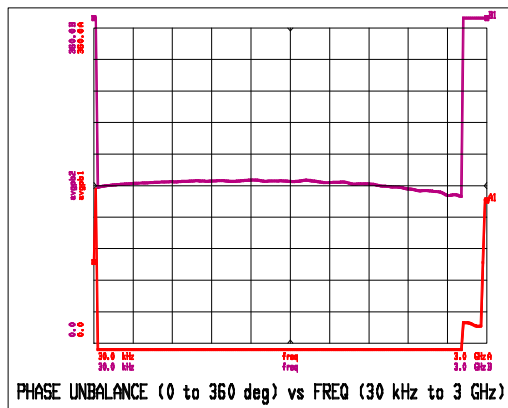
Insertion Loss



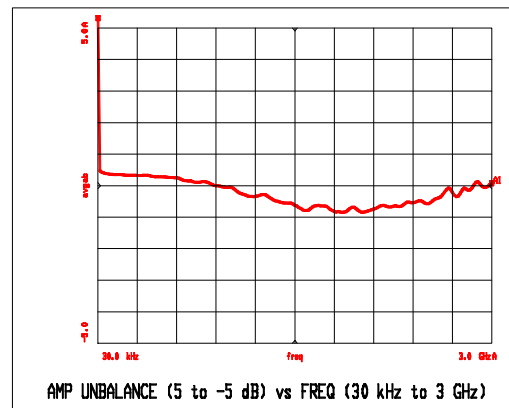
Input Impedance



Phase Unbalance



Amplitude Unbalance



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Technical drawing of a 6-hole punch die, showing top, side, and cross-sectional views with dimensions.

Top View Dimensions:

- Overall width: $12.0 \pm 0.3 (W)$
- Overall height: $1.75 (E)$
- Distance between hole centers (vertical): $2.0 \pm 0.05 (P2)$
- Distance between hole centers (horizontal): $8.0 (P1)$
- Distance from hole center to side edge: $5.5 \pm 0.05 (F)$
- Distance from hole center to top edge: $0.4 \pm 0.05 (T)$
- Distance from hole center to bottom edge: $2.9 (K0)$
- Distance from hole center to side edge (bottom): $4.0 (Bo)$
- Distance from hole center to side edge (top): $0.3R \text{ MAX}$
- Distance from hole center to side edge (bottom): $4.0 (Po)$
- Distance from hole center to side edge (top): $0.15 \pm 0.1 / -0 (Do)$
- Distance from hole center to side edge (bottom): 0.15 ± 0.1

Section B-B (Side View):

- Overall width: $4.0 (Ao)$
- Overall height: $1.75 (E)$
- Distance from hole center to side edge: $0.4 \pm 0.05 (T)$
- Distance from hole center to bottom edge: $2.9 (K0)$
- Distance from hole center to side edge (bottom): $4.0 (Bo)$
- Distance from hole center to side edge (top): $0.3R \text{ MAX}$

Section A-A (Cross-sectional View):

- Overall width: $4.0 (Ao)$
- Overall height: $1.75 (E)$
- Distance from hole center to side edge: $0.4 \pm 0.05 (T)$
- Distance from hole center to bottom edge: $2.9 (K0)$
- Distance from hole center to side edge (bottom): $4.0 (Bo)$
- Distance from hole center to side edge (top): $0.3R \text{ MAX}$

USER FEED DIRECTION (indicated by an arrow pointing right)

Item	Dimension
Ao	4.00mm +/-0.1mm
Bo	4.00mm +/-0.1mm
Ko	2.9mm +/-0.1mm
W	12.00mm +/-0.3mm
P1	8.00mm +/-0.1mm

Part Number	Package
ETC1-1-13TR	2000 piece reel

4. Reference Application Note M513 for reel size information.
5. All sample boards include 5 loose parts.

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