

## Features

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

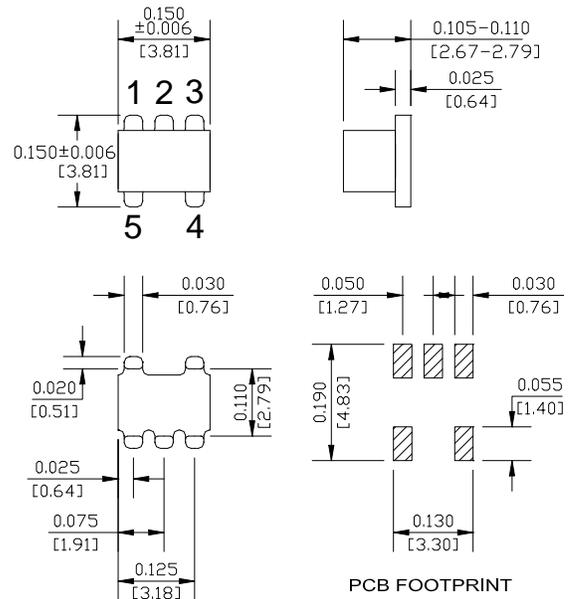
## Description

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

## Product Image



## SM-22 package



## Pin Configuration<sup>3</sup>

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

3. The exposed pad centered on the package bottom must be connected to RF and DC ground.

## Ordering Information<sup>1,2</sup>

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

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

## Absolute Maximum Ratings<sup>4,5</sup>

Parameter	Absolute Maximum
DC Power	250mW
DC Current	30mA
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +125°C

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. M/A-COM does not recommend sustained operation near these survivability limits.

\* 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.

• **North America** Tel: 800.366.2266 • **Europe** Tel: +353.21.244.6400  
• **India** Tel: +91.80.4155721 • **China** Tel: +86.21.2407.1588

Visit [www.macomtech.com](http://www.macomtech.com) for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

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

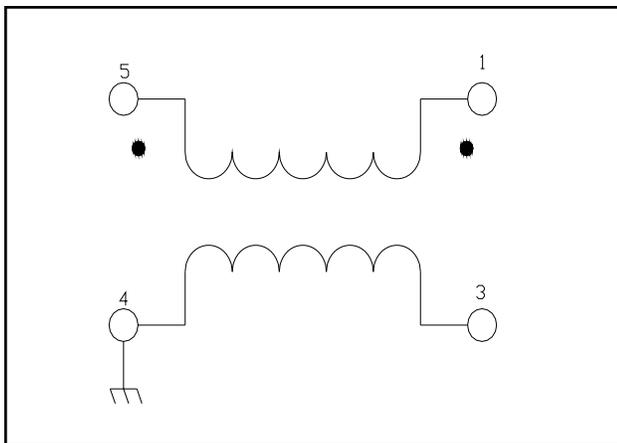
Rev. V5

**Electrical Specifications:**  $T_A = 25^\circ\text{C}$ ,  $V_{\text{HIGH}} = 3.0\text{ V}$ ,  $V_{\text{LOW}} = 0\text{ V}$ ,  $Z_0 = 50\ \Omega$ <sup>6</sup>

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

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

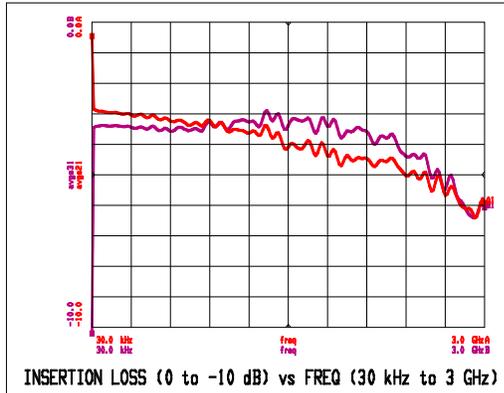
### Schematic



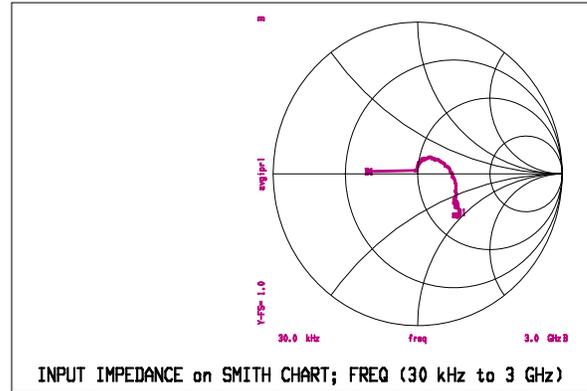
† Reference Application Note M538 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.

## Typical Performance Curves

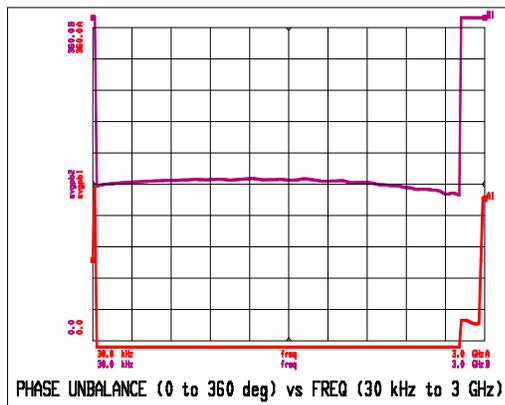
### Insertion Loss



### Input Impedance



### Phase Unbalance



### Amplitude Unbalance

