

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

Rev. V5

## 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



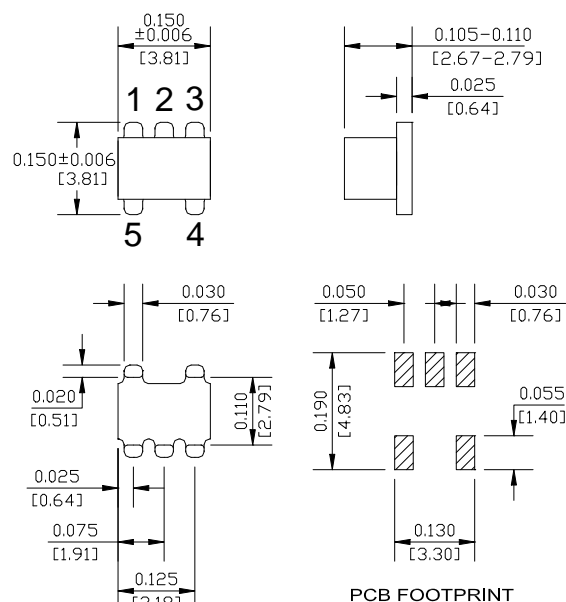
## Ordering Information<sup>1,2</sup>

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.

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

## 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.

### 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.

## E-Series RF 1:1 Transmission Line Transformer

### 4.5 - 3000 MHz

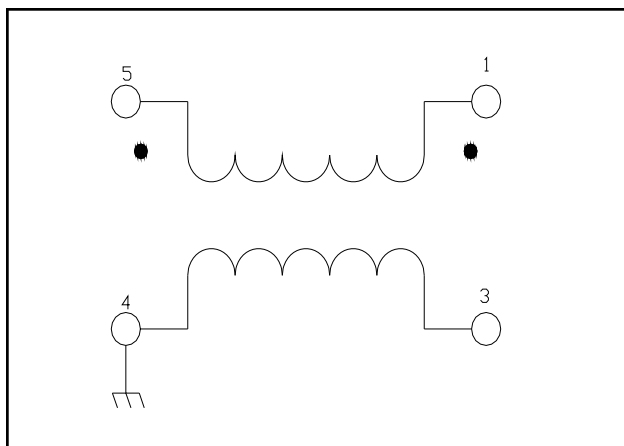
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**Electrical Specifications:**  $T_A = 25^\circ\text{C}$ ,  $V_{\text{HIGH}} = 3.0\text{ V}$ ,  $V_{\text{LOW}} = 0\text{ V}$ ,  $Z_0 = 50\ \Omega$ <sup>6</sup>

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



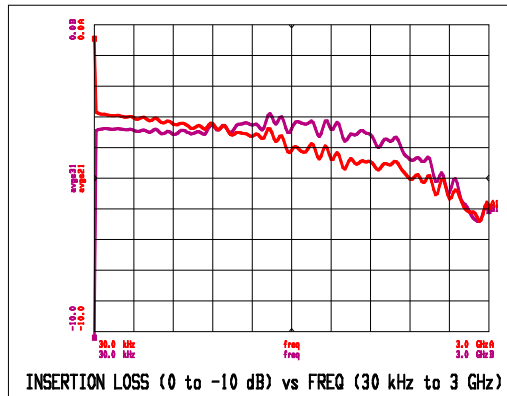
† Reference Application Note M538 for lead-free solder reflow recommendations.  
Meets JEDEC moisture sensitivity level 1 requirements.

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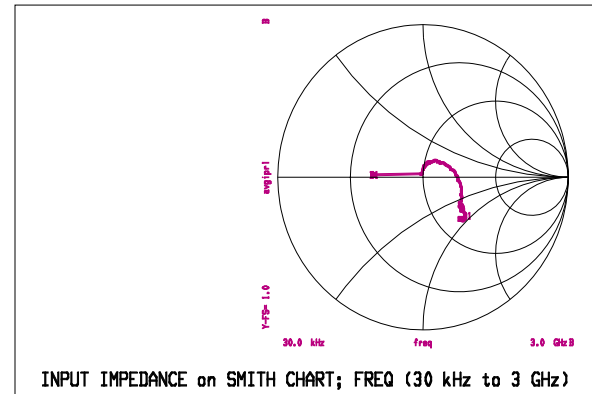
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### Typical Performance Curves

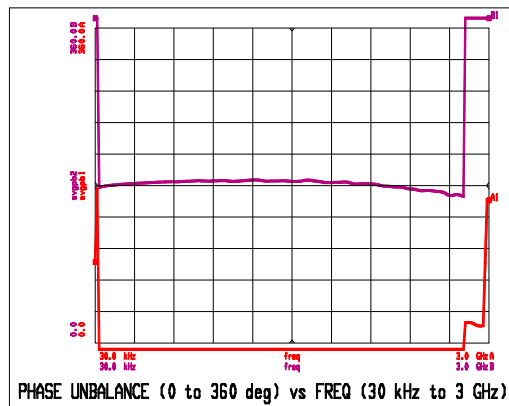
#### Insertion Loss



#### Input Impedance



#### Phase Unbalance



#### Amplitude Unbalance

